

**Master in Teaching Program 2012 - 2014**

# **Widening the Circle:**



**Seeking Inclusive Education**

**Conference Proceedings of Annual Presentation of Master's Papers**

**March 14th 2014**

**The Evergreen State College, Tacoma, WA**

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Master in Teaching Program 2012-2014

# **Widening the Circle: Seeking Inclusive Education**

The Evergreen State College, Tacoma  
March 14, 2014

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# Foreword

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There is no such thing as a good or a bad teacher, but rather there are good and bad teaching days. It is what we do with those days that determines the quality of our character, skill and perhaps also our spirit as teachers. Through the act of inquiry, days that are puzzling and disappointing can spark questions, focus efforts, inspire collaborations and foreshadow important discoveries that could help us better serve students. Evergreen's Master in Teaching (MiT) program expects its candidates to develop this stance. We seek to prepare future teachers who critically analyze their decisions in order to best support the children and youth in front of them.

This volume represents the MiT candidates' journey toward developing the practices involved in enacting this stance. More than a set of literature reviews, it represents a collaborative effort to learn and engage a process of professional growth. Candidates first learned how to thoughtfully examine and critique their teaching through using weekly reflections on lessons, feedback from mentor teachers and faculty, and self-assessments on Charlotte Danielson's *Framework for Teaching*. They identified the areas where they were less skilled and developed professional growth plans to strengthen them. They chose to inform one of those areas through research in the field of education.

There is much to learn in becoming a critically aware user of the research, or becoming a *savvy shopper*, as one candidate described it. Candidates formed a professional learning community in order to investigate their area of needed growth. They built background knowledge of their topic, discussed research articles, examined themes in the research findings, and co-wrote the rationale and conclusion for their literature reviews. Instead of making an argument and gathering evidence to prove their point, they had to think and write about the research in a way that was circumspect. Without overstating conclusions, they worked to notice new ways of making sense of their practice and identify ideas worth trying with their students.

Refining practice is hard to do in isolation; there is wealth in grappling together with a community of people who have common questions. Many candidates came to realize the skill and practices involved in developing a fruitful collaboration – making the old adage “*the whole is greater than the sum of its parts*” hold true. Many also learned the value of revisiting and adjusting their approaches to the collective work as a way of making sure they were not only meeting goals, but also mutually benefiting from the collaboration.

This volume is a record of the moment in time when these future teachers paused to share what they had learned and what they had decided for the next steps in their ongoing teaching explorations and experiments. In a year or ten years' time, this document will be an artifact to help them notice what else they have learned since writing these reviews.

We as faculty are confident that the candidates' future students will benefit from this thoughtful and collaborative approach to professional development.

Sonja Wiedenhaupt    Kelly Foster



# Engaging Students' Funds of Knowledge Through Personal, Family & Community Connections

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*Eliza Alexander, Josefina Cullinane, Daniel Moskin, Emily Newton, and Brianna Todd*

This paper aims to answer the question, *what are effective strategies for and what is the impact of engaging students' funds of knowledge in order to facilitate an equitable learning environment?* Funds of Knowledge (FoK) is a pedagogical term that refers to all of the skills, abilities, practices, ideas, experiences, and domains of knowledge that a student acquires and can access throughout their lives outside of school (González et al., 2005). Examples include their cultural heritage, parents' occupations, household duties, community norms, and the myriad other experiences that make up their perceived reality when they enter a classroom. In this paper, we will explore strategies that support learning for all students, with an emphasis on meeting the needs of students whose experiences and knowledge have been traditionally ignored in mainstream education. This includes students of color, students of low socioeconomic status, immigrant populations, and students from urban and rural communities. This paper explores the central question by first presenting a discussion of the history and cultural context of education in the U.S., followed by an introduction to the theoretical frameworks of Culturally Responsive Pedagogy and Funds of Knowledge. The paper then provides an overview of issues and points of disagreement surrounding these frameworks. The body of the paper includes critiques of relevant research studies that attempt to analyze students' experiences in the classroom and the involvement of their families and communities in the curriculum. These critiques allow for a closer exploration of overlapping areas of Funds of Knowledge research, thereby providing a thorough investigation of our central question.

**Keywords:** *Funds of Knowledge, Culturally Responsive Pedagogy, culturally relevant teaching, service learning, academic discourse, arts integration, collaborative learning, parent and family communication*

While the population of the United States is becoming increasingly diverse, public schools have maintained their status as institutions that celebrate and replicate European, middle-class values (Spring, 2013). This pervasive belief that children from all backgrounds can and should learn the same way has resulted in culturally exclusive curriculum that fails to support the diverse learning needs of students. These materials are generated from a middle-class Eurocentric perspective and are not responsive to the cultural realities of Native, Latino, African, and Asian American students, immigrant students, and students from low socioeconomic backgrounds (Gay, 2010).

The use of culturally exclusive curriculum is potentially alienating and can result in disengagement with school and decreased access to academic language and cultural capital (Valenzuela, 2002). This disengagement can be demonstrated by U.S. graduation rates, which are low overall, but especially for students of color. A 2013 report by the Department of Education states that only 78% of U.S. students graduate high school after four years, and that the percentage is even lower for African-Americans (66%) and Latinos (71%), (Department of Education, 2013).

The recent emphasis on standardized curriculum and high stakes testing may also be partially to blame for a discrepancy in academic achievement across various student populations. As a result of the No Child Left Behind Act, standardized testing has been adopted in the United States as a way to measure achievement, effectiveness of educational programs, and placement of students into specialized programs (Department of Education, 2013). Because of this legislation, it has become increasingly important for teachers to link curriculum with high stakes test materials, and support students in ways that prioritize meeting established, homogenous performance-goals over more individually relevant and meaningful learning targets (*Digest of Educational Statistics* as cited in Gay, 2010).

The discrepancy between academic achievement for students from the “dominant culture” and students from marginalized backgrounds suggests not only an academic but a cultural disconnect between schools and their students. For these reasons, Gay (2010) suggests that rather than focusing on a gap in achievement, we should be addressing a gap in opportunity. The term “opportunity gap” refers to the idea that because American school models for teaching traditionally operate from the dominant Western European middle class perspective, many students from non-dominant cultural backgrounds have fewer opportunities to interact with curriculum and pedagogy that meets their cultural learning needs (Gay, 2010).

This raises the question: how can educators address the effects of this cultural disconnect in order to support academic achievement and engagement for all students?

**Defining terms.** In response to the expanding gap in achievement and opportunity, theorists and teachers have proposed a shift towards a more a culturally inclusive philosophy of teaching. The term Culturally Responsive Pedagogy (CRP) refers to classroom instruction that is consistent with students’ cultural orientation (Ladson-Billings as cited in Gay, 1992). In exploring the research, theory, and practice of CRP in her book *Culturally Responsive Teaching*, Geneva Gay (2010) proposed CRP as a way to increase motivation, engagement, and academic achievement for students of color by recognizing the knowledge and skills that these students bring with them to school. Teachers engage in culturally responsive pedagogy by investigating and validating students’ personal and cultural assets and incorporating these into meaningful instruction. Additionally, teachers must analyze their own cultural perspectives and assumptions as a means of recognizing and working through personal biases and building a more equitable learning environment (Gay, 2010). This approach directly challenges the deficit perspective, which perceives divergence from a dominant cultural standard as negative or lacking.

Funds of Knowledge (FoK) and, thus, our central question is situated within the framework of a culturally responsive pedagogy. Accessing and engaging students’ funds of knowledge is one of the ways that culturally responsive educators create meaningful learning opportunities for their students. According to Moll and González (2005), FoK is a way to use “students’ knowledge and prior experience as a scaffold for new learning” (p. 135), integrating school learning with what the students already know and are familiar with. This is supported by physiological research about the

brain and learning cycle. Because students learn by connecting new information to pre-existing neuronal structures in the brain, implementing FoK strategies as part of a culturally relevant curriculum will not only provide students with meaningful entry points into classroom learning, but will build the foundation for more physiologically effective learning cycles to occur (Zull, 2002).

Identifying effective strategies for engaging students' funds of knowledge is an important venture for the educational community. Students show improved academic achievement when teachers offer instruction in a personally relevant context that is meaningfully situated within their everyday lives and experiences (Gay, 2010). Implementation of FoK strategies in curriculum gives voice to students and validates their experiences, thereby fostering equitable and democratic classroom practices. This culturally responsive practice has the potential to greatly impact students' engagement with school, foster a positive cultural self-image, and increase access to cultural capital (Valenzuela, 2002).

**Issues and points of disagreement.** There are a number of barriers that prevent teachers from being able to access and engage students' funds of knowledge. Such impediments are important to acknowledge in order to recognize potential pitfalls, and consider alternative actions and routes that still allow us to work both within the FoK framework, and within the realities of the 21st century public school. Among the challenges of implementing FoK strategies are meeting the inherently demanding curricular adaptations, communicating meaningfully with family and community members, and adhering to an increasing emphasis on standardized curriculum and assessments.

Teaching within the FoK framework requires teachers to be culturally responsive, to recognize their own cultural encapsulation, to understand power dynamics within the school structure, and to recognize different kinds of cultural capital that their students carry— not just what fits within the dominant culture (Gay, 2010). It requires a different kind of work on the part of the teacher to plan for flexibility within the curriculum, to figure out what each students' funds of knowledge are, and to integrate them within the curriculum (González, 2005).

Application of the FoK framework is also dependent upon forging relationships with families and community members, not just students. Many teachers work in communities that are different from their own; because of this, they may not feel confident investigating students' funds of knowledge. Additionally, communicating with families from linguistically diverse backgrounds may require additional resources. While schools are required by federal law to provide translation and interpretation services for teachers and families, these services require considerable advanced notice (Title VI of the Civil Rights Act of 1964). Conversely, some families and communities may be wary of teachers who attempt to investigate their students' experiences, while others believe that student experiences at home are irrelevant to curricular content.

Teachers must find ways to authentically connect with students' families and communities, without over-generalizing about groups of people or spotlighting - calling on individuals to act as cultural ambassadors (Gay, 2010). Not every student will share equally in the funds of knowledge of their cultural group, and teachers must work to help students become reflective and aware of their individual funds of knowledge to avoid stereotyping and alienating students (Gutierrez & Rogoff, 2003).

We must also consider the immense pressure on teachers and schools to produce higher standardized test scores. These scores affect how much federal funding schools receive, as well as teacher's effectiveness ratings and job security (Department of Education, 2013). As a result of this mounting pressure, many educators and administrators adopt more structured curriculum with fewer

opportunities for integrating students' funds of knowledge (Spring, 2013).

Attention to each of the issues listed above amounts to a heavy workload, and one that requires constant vigilance on the part of teachers. As emerging teachers, likely to be short on time and overwhelmed with new obstacles and challenges, working towards a culturally responsive practice will require additional demands of time and resources. It is with these considerations that we aim to explore various domains in which teachers can begin to incorporate the FoK framework into their practice.

**Statement of limits.** In selecting research studies for inclusion in this synthesis, we focused on finding both qualitative and quantitative peer-reviewed research studies from academic journals. While most of the studies took place in the United States, two were conducted in foreign countries and translated into English. All of the studies were identified through the use of the online databases made available to students at the Evergreen State College. These primarily include the following academic databases: EBSCOhost, and ERIC. Secondary sources, such as relevant literature reviews and trade books, revealed names of researchers, references to specific studies, and subject-specific vocabulary and concepts that were then used as search terms within the given databases. Some of the most common search terms used centered around the frameworks of Funds of Knowledge and Culturally Responsive Pedagogy. There were a number of synonyms we used for finding articles related to Culturally Responsive Pedagogy including culturally "relevant," "congruent," or "aligned" pedagogy.

Patterns that speak to the limitations of our research procedures have emerged within the body of studies that we have chosen to analyze. The majority of the studies we found were qualitative studies, and several of these were action research projects and case studies. These studies were conducted within small settings and among specific populations, with elementary-aged participants and urban schools making up the majority of the samples. Many of the studies used purposeful sampling methods in order to focus on students or teachers with specific cultural, linguistic, or socioeconomic backgrounds. For example, several studies focused primarily on African-American, Mexican-American, or ELL/dual language participants. Because of the nature of these studies, the ways in which we could transfer their findings would be contextually dependent and subject to interpretation. Given the specificity of the sample populations and classroom environments, there are limitations to the age and background of students, families, or teachers to which we can transfer or generalize the findings from the studies. While we were unable to apply findings from these studies to all students in a given classroom, we felt confident that we could glean underlying principles of practice, ideas for culturally responsive strategies, and the kinds of misconceptions that come up when using a FoK framework. Given the constraints outlined above, this paper will critically review 25 research studies related to five components of the Funds of Knowledge framework.

**Introduction to individual sections.** Within this literature review, we explore the various domains in which teachers, students, families, and communities can collaborate to engage students' funds of knowledge in order to best support students' academic achievement. We review relevant qualitative and quantitative research studies that illuminate successful strategies or considerations for culturally relevant classroom practices, as well as family and community collaboration. We begin with an investigation of strategies for promoting respectful and fruitful communication with parents and families in order to access students' funds of knowledge. Next, we focus on classroom practices and explore the impacts of and strategies for engaging students' funds of knowledge in meaningful curriculum. Within this realm, we first explore the linguistically diverse classroom, and investigate

the impacts of and strategies for accessing and utilizing students' funds of knowledge through responsive discourse practices and expectations for communication. Then we examine opportunities for incorporating students' funds of knowledge within collaborative learning experiences. Following this is an investigation into the potential for arts-based curriculum to serve as a tool to exercise students' funds of knowledge in meaningful ways. We then move beyond the classroom to the greater community. In the final section of this paper, we examine the potential of problem-based instruction and service learning to engage students' funds of knowledge and promote greater school/community discourse.

***Parent and family communication.*** There are a variety of tools that educators may use to access students' funds of knowledge. Perhaps one of the most important considerations is the influence of parents and families on students' prior knowledge, capital, and cultural identity. In the first section of the analysis, we explore the question, *what are effective strategies for reciprocal, and culturally sensitive communication with parents, families and guardians in order to provide more equitable and engaging learning opportunities for students?* For teachers, ongoing communication with parents, families and guardians is essential to fully understanding the context and perceived reality of our students. Families can also provide us with a greater pool of resources from which we can build our curriculum (González et al., 2005). If we are to build culturally responsive curriculum rooted in funds of knowledge theory, curriculum that engages students in the third space between home and school (Calabrese Barton & Tan, 2012), we must first build bridges with those people that know them and love them.

***Academic discourse.*** The second section of the analysis will explore the question, *what are the ways that students' linguistic backgrounds can be integrated with academic discourse?* It will first provide a justification for why using students' linguistic funds of knowledge is important when teaching academic discourse. It will then review research relating to the ways the teachers have used students' linguistic funds of knowledge and the effects on their learning. Lastly it will provide a summary of new insights gained from the studies, additional questions, and recommendations for further research.

***Collaborative learning.*** In addition to bridging home and school cultures as a way to connect students with academic content, culturally relevant pedagogy (CRP) involves using instructional strategies that can best support student learning. The third section of the analysis will explore the question, *what are ways in which students' funds of knowledge can be incorporated into collaborative group work to improve achievement?* Collaborative group work appears throughout CRP literature as a best practice for supporting students of color (Gay, 2010; González et al., 2005). In reviewing research that addresses various overlapping aspects of collaborative group work, this section will uncover broad themes and specific strategies for drawing on students' funds of knowledge within group work. More specifically, this section will provide an analysis of studies that focus on the cultural congruency of group work, as well as studies that explore the effectiveness of group work on improving academic performance for culturally and linguistically diverse students.

***Arts integration.*** Students' funds of knowledge can offer powerful gateways to learning (González et al., 2005). So too can integration of the arts throughout content areas (Lorimer, 2011). As teachers develop their practices and the lived experiences, abilities, and interests of our students to help direct curriculum; they attempt to examine the many ways that bridges between school and home, family, and community have the potential to create relevant, challenging, and enriching learning environments for all students. The next section of the analysis will explore the question, *how*

*do students building authentic connections between their worlds and the classroom benefit from or depend on arts integration as access points to deeper learning?*

**Service learning.** The last section of the analysis will explore the question, *how can teachers use problem-based instruction and service learning to connect with students' funds of knowledge?* This section will begin by providing justification for these instructional methods by describing the effects of problem-based instruction and service learning on students' academic achievement and motivation. It will then provide further exploration into how teachers have effectively implemented problem-based instruction and service learning in ways that connect to students' funds of knowledge.

## **Parent and Family Communication**

*by Brianna Dignan*

This section of the paper investigates the specific research question, *how can teachers collaborate with parents and families to provide more equitable and engaging learning opportunities for students?* This question represents an important component of accessing and fully understanding students' funds of knowledge. Parents, guardians, and family members account for a large portion of students' funds of knowledge. According to Gonzalez and Moll (2005), a students' funds include not only their own prior knowledge, but also the knowledge and experience capital of other members of their household. Open and frequent communication with parents and families allows teachers to build a better understanding of the scope of funds that their students' possess. The studies analyzed in this section support the notion that parent and family involvement is a valuable pedagogical consideration. They also emphasized the importance of being accommodating, approachable, and respectful in outreach practices, so that parents and families of all backgrounds can see a clear and comfortable entry point into their child's classroom.

Some of the main journal databases that I used in my search for relevant research studies were EBSCOhost, JSTOR, and Google Scholar. I used search terms such as, *Funds of Knowledge, parent school connection, parent outreach strategies, family school connections, parent teacher communication, parent involvement, parent engagement, and incorporating parents in the classroom.* The two most common types of studies I found were case studies and correlational research. I was unable to find any experimental or quasi-experimental studies in which a specific outreach strategy was tested against a control. A lot of the studies I found in my research centered around the elementary school setting, and I had difficulty finding studies that were specific to the secondary level.

Exploring strategies for communicating with parents and families is important to me as a preservice teacher because I believe that knowing where students are coming from, and utilizing the resources that exist in every student's home life is integral to providing students with equitable and relevant instruction (Calabrese Barton & Tan, 2012). This is a part of the teaching process that I felt uncomfortable with during my student teaching placement, and one that I strive to improve upon going forward.

My purpose in exploring the research within this field was to uncover some proven strategies that I could utilize in my own classroom to communicate and collaborate more effectively with the parents and families of my students. I entered into this project recognizing and honoring the undeniable variability that exists across classrooms and families (Rogoff, 2003), understanding that

no single strategy would be the lone answer to my question. With that in mind, I have worked to identify new considerations and culturally responsive strategies that will help me to improve my own communication skills with parents and families, so that I can provide my students with curriculum that supports their unique learning needs and perspectives (Gay, 2010).

**Review of literature.** McNeal (2012) investigated the correlation between reported parent involvement levels and student achievement. As the author explained, there are many research studies that demonstrate a positive correlation between parent involvement and student achievement. Conversely, there are also some studies that show that parent involvement actually negatively correlated with student achievement. The Parent Involvement Reactive Hypothesis attempts to explain this phenomenon with the proposition that decreasing student achievement often causes parents to become more involved as a reaction. McNeal used quantitative methods, in the form of a 3-panel, cross-lagged regression model analysis, to determine whether or not parent involvement can be considered a viable predictor for student achievement, and whether or not the Parent Involvement Reactive Hypothesis is statistically supported by data.

The author collected a sample of 7,983 students from the National Education Longitudinal Study (NELS) database using criterion sampling methods. The subjects had to have undergone three waves of tests and had parent involvement data, in the form of a survey response, on record. It was unclear from the written description, but it seemed that all students that met the above criteria were included in the final sample. Data was collected for students at 8<sup>th</sup>, 10<sup>th</sup>, and 12<sup>th</sup> grade levels.

McNeal (2012) subjected the data to a longitudinal statistical analysis. The independent variable in this study was the level of parental involvement with student's schoolwork. A survey or questionnaire distributed by NELS researchers and completed by parents was used to assess the level of parent involvement. Responses were stratified into three categories; discussion, monitoring, and educational support practices. They were then analyzed and quantified to produce three parent involvement "scores". The two dependent variables in this study were student truancy and achievement levels. The researchers quantified truancy as the number of times the student skipped class in that academic year. The researchers measured achievement by the student's standardized science test scores in that academic year. Exogenous variables such as race, gender, and socioeconomic status were also analyzed as covariates.

The author found a significant positive correlation between parent involvement and student achievement. He also found that in all but one regression pathway, there was a significant negative correlation between parent involvement and student truancy. The relationship between 10th grade parental monitoring levels and 10th grade truancy did not yield significant results. The correlation between parent involvement and student achievement suggests that the level of parental involvement may be a predictor of higher student achievement and lower student truancy within the same academic year and in following years.

The findings also suggested that rather than lower student achievement being a predictor for increased levels of parent involvement, as the reactive hypothesis presumes, increased student truancy may actually be a predictor for decreased parent involvement. The findings served to discredit the Parent Involvement Reactive Hypothesis. The analysis also exposed a significant lagged negative correlation between student truancy and parent communication. If students were truant, for instance, in 8<sup>th</sup> grade, the level of parent communication tended to decrease by 10<sup>th</sup> grade. Likewise, there was a significant lagged positive correlation between student achievement and parent communication. If students performed poorly on standardized tests in 8th grade, the level of parent communication was

likely to decrease by 10th grade.

The large and variable sample pool, and the use of objective sampling methods within this study indicated the findings could be generalized to a wide range of secondary student populations throughout the U.S. Because the author used an objective approach and included extraneous variables in the analysis, these results can be considered trustworthy, and should be reliable over time. However, there were some components of the study that made me question the types of conclusions I could draw. For instance, the author chose to measure science achievement as the measure of all academic achievement. He explained that he chose this measure so that it would be parallel to similar studies that have historically focused on science achievement. It still seems highly plausible that some overall academically successful students perform poorly in science and some students that struggle academically in many other subject areas perform well in science. This suggests that the results of this study could be generalizable to success in science but not necessarily to overall academic success.

Some of the measurements used in this study were dichotomous, when they merited greater nuance. For instance, truancy was measured as yes/no. If a student skipped school just once during the academic year, they were grouped with students who skipped school far more frequently, and may have even been habitually absent. To me, this was not an accurate representation of truancy, and it made me question the external validity of the findings.

The findings in this study served as a good starting point as I began to look for strategies to build communication with parents and families. This study confirmed one of my original assumptions; that in most cases, parent involvement positively correlated with student participation and achievement in school. The results also made me consider whether there may be any instances in which parent involvement may actually have a negative impact on student participation or achievement. Although the author was not able to give an explanation, the results discredited one popular explanation - the reactive hypothesis. The findings suggested that lower levels of student participation and achievement may actually be a predictor for lower levels of parent involvement. The participants in this study were all teenagers, so this correlation could be related to their teenage inclinations toward rebuking their parents' authority. I would like to explore research related to student perspectives on parent involvement in school, to see if they possess any insight as to when parent involvement becomes harmful. I would also like to find some studies that examine the same or similar data as this study, but with a younger population of students, in order to see if there is any relationship between age, and the benefits reaped from parent involvement practices.

McNeal's (2012) research helped us to understand that parent involvement in students' education can be an important factor in students' academic success. This conclusion was supported by numerous other studies cited by Patrikakou & Weissberg (2008) in the introduction of their research study. As the researchers explained, parent-child relationships can have a profound affect on students' neurocognitive development. If teachers wish to support student achievement in a powerful way, they need to identify ways to support parents' ability to become and stay involved in their child's education. They must also explore the behaviors that teachers employ that support or hinder parents' ability to engage with their child's education. From within the postpositivist paradigm, Patrikakou & Weissberg used quantitative methods to measure the relationship between parent's perceptions of teacher outreach practices, and their level of involvement with their child's education.

For this predictive correlational study, the authors identified three urban elementary schools from the same district from which to gather their sample. It was unclear why they chose these schools. Two of the participant schools had a 100% African American population. The third school

had a 96% Latino population. All three schools have historically low standardized test scores, with less than 24% of students performing at or above grade level. The authors used convenience sampling to gather their data. Within each school, classroom teachers were responsible for handing every child a questionnaire to take home to their parents. 64% of parents returned a questionnaire. These respondents made up the sample population.

The four page questionnaire was produced in both Spanish and English. Parents were asked to share sociodemographic data, including gender, ethnicity, highest education level, employment status, and family structure. They were then asked to share how many times per week they engaged in various behaviors both at home and at school, that aimed to support their child's education. Examples of behaviors listed on the questionnaire included talking to their child about what they learned in school, and checking their child's report card. Possible answer choices ranged from less than once per week to five-seven times per week. Similarly, they were asked to rate the frequency with which their child's teacher engaged in various parent outreach behaviors. Examples of behaviors included sharing positive information about their child, and being available for phone or in-person conversations. Possible answer choices were "never", "sometimes", and "usually"

Patrikakou & Weissberg (2008) compared and analyzed their data in a number of ways. They provided a descriptive analysis of collected data, identifying some of the most and least reported behaviors associated with parent involvement. They also used statistical analysis to compare reported levels of parent involvement with each component of the demographic data as well as with parents' perceptions of teacher outreach practices.

The authors used regression analysis to examine the relationship between parent involvement at school and at home (criterion variables) and the sociodemographic data (extraneous variables). They found no significant correlation between any of the sociodemographic data and the level of parent involvement at home or at school. That is, sociodemographics cannot be used to predict how involved a parent will be with their child's education. They did, however, find a significant positive correlation between parent perception of teacher outreach practices (predictor variable), and parent involvement at home or at school. That is, parents who saw their child's teacher actively reaching out to them, were also more likely to be actively involved with their child's education at home or at school.

These findings pointed to a clear relationship between parent's perceptions of teacher outreach practices and their level of involvement with their child's education. However, an important caveat is that we cannot identify causality between these two variables. It could be that effective teacher outreach practices influence parents to become more involved. Conversely, it could be that parents who are already involved are more likely to notice when teachers attempt to reach out to them. A longitudinal study in which subject's responses were recorded over time would be necessary to determine causality. I would also look for questionnaire items that ask parents explicitly whether or not certain teacher practices influence their level of involvement with their child's education.

The authors were able to isolate and compare other sociodemographic data and show that there is no correlation between sociodemographics and parent involvement. This was an important finding to note because a lot of politicians and commentators, and even educators, tend to overlook the willingness of minoritized parents to be involved with their child's education. This study suggested that ethnicity, socioeconomic status, and family structure are not valid predictors of whether or not parents will become involved.

Despite the relevance of some of the findings, there were some serious weaknesses within

this study that affected internal validity and generalizability. The testing instrument (the questionnaire) did not account for interpretive differences among respondents. For instance, one parent may have a different interpretation of what it means to help their child with homework than another does. By only using surveys, the authors may have overlooked complexity within parents' answers, thus affecting the internal validity of the study. The questionnaire was also only offered in written format, in two languages. This may have excluded parents who were illiterate or non-proficient in English or Spanish. Parents who were too busy to take the time to complete and return the survey may also have been overlooked, thus affecting whether the study was in fact capturing a complete picture of parents' experiences. These shortcomings affected my ability to generalize the findings to hard-to-reach parents because the sample population only included those parents who were already involved enough to complete the survey.

I found the descriptive analysis of this study to be more useful than the statistical analysis. The authors identified some of the most and least reported behaviors associated with parent involvement, both at home and at school. At home, parents were most likely to check in with their child's homework or actively help them with it. They were least likely to read to their child. At school, parents were most likely to attend parent-teacher conferences, or volunteer within their child's classroom. They were least likely to call or visit with their child's teacher outside of school-mandated conferences, or ask the teacher how they could support their child at home. The most commonly reported mode of teacher outreach was the teacher contacting the parent to inform them of disciplinary issues concerning their child. The least commonly reported mode of teacher outreach was teachers encouraging parents to visit their child's classroom.

The descriptive findings helped me to identify some of the behaviors that teachers engage in that parents are likely to notice. If a teacher believes they are reaching out to parents and family members, but their practices aren't actually noticed or relevant to parents' lives, then precious time is wasted. This made me wonder if it would be useful teacher practice to periodically ask parents to identify teacher outreach practices that they have noticed within your class. This approach still would not address the issue that parents who are already involved tend to be more likely to notice teacher behavior patterns in the first place.

Because individual parents' perceptions and needs are so variable, it seems that the flexible and descriptive nature of qualitative studies may make them a more appropriate tool for understanding what factors truly support or hinder parent involvement. Pena (2000) used interviews and prolonged observation to build a case study that examined barriers and windows to parent involvement in the elementary school setting. The author cited various studies that demonstrate the myriad reasons why parents and schools are failing to work together in meaningful ways, including a lack of school organization, a lack of teacher training, parent/teacher power struggles, and many cultural, linguistic, and socioeconomic barriers. Hispanic families in particular, are more likely to cite language as a barrier to school involvement. With this context in mind, the author attempted to identify some of the specific barriers that prevent Mexican-American parents from participating more readily in their students' formal education.

This case study centered around one elementary school in an urban, predominantly Mexican-American community in Texas. Pena (2000) used a stratified purposeful sampling method to choose participants who could speak to some of the variability within the Mexican American community (e.g. - education level, nation of birth, language spoken at home, etc). She used criterion sampling to first identify the school, based on ethnic composition of students (at least 70% Mexican-American),

and the implementation of active parent-involvement programs. Within the school she identified four classrooms, and sent introductory letters and consent forms to parents of each student. Out of 75 families, 28 agreed to participate in the study. They represented students from different grade levels, and with different language backgrounds, family structures, and socioeconomic status.

Pena (2000) used home visits, parent meeting observations, informal discussions, and formal parent interviews to gather her data. She also collected relevant school records including minutes from various school organizations' events, including Parent Teacher Organization (PTO) meetings, as well as letters sent to parents throughout the school year. The author observed meetings of the Campus Advisory Council (CAC), the PTO, and a variety of school-sanctioned activities to which parents were invited, including Back to School Night, Family Math Night, and various cultural events. She also observed over 19 parent-teacher conferences. All observations were conducted using the participant-observer method, and detailed notes were kept for each event.

Through this study, the author was able to identify some general themes of factors that influenced parents' decision to participate in their child's formal education. These themes were language, parent cliques, parent education level, attitudes of school staff, cultural influences, and family issues. In particular, the author noted that non-fluency in English served as a major impediment to parent involvement. Even in this particular school, which offered a federally funded Dual Language program, school-sponsored events, CAC, and PTO meetings were often conducted primarily in English. This proved difficult even for parents who were mostly fluent in English. Some reported that they were afraid of misunderstanding or saying something wrong, so they didn't voice their questions or opinions in such meetings. Parents who experienced this often stopped attending such meetings because they felt it was a waste of their time.

Parent level of education was another factor that affected parent participation. Many parents with little to no formal education reported feeling that they couldn't help their child with academics because they had little academic knowledge themselves. Of these parents, few expressed their concerns with teachers or school administrators, who assumed that parents could read all of the literature they sent home (in either English or Spanish). The researcher observed a number of instances in which parents with limited literacy skills remained confused about instructions, information, and school procedures, but did not ask questions of teachers or administrators because they were intimidated. Some parents reported that they participated less in school events because they were afraid of being embarrassed by their lack of understanding. Because the sample school was 96% Mexican-American, a lot of parents had similar cultural expectations. However, the author did note that parents who were born in the United States were more likely to participate in school activities because they felt they understood the school system well enough to maneuver it. Parents born in Mexico reported feeling intimidated by and unsure of the school system, causing them to avoid school events. Other family issues also influenced participation, including issues with access to transportation and child care. Irregular or long work hours also affected parents' ability to participate in many events.

The attitudes of school staff also greatly influenced the ways in which parents were involved. The school valued parent involvement and required teachers to be more accessible to parents, but many teachers still viewed parent participation as an additional burden to their already busy days. Few teachers attended PTO meetings, which didn't go unnoticed by parents. Many parents felt that teachers did not value their input or take their suggestions into consideration.

This case study focused on a school community that was 96% Mexican American. Because it

was based around a non-ethnically diverse school community, the issues parents raised may be particularly pertinent to school contexts where the student population comes from a similar background. Some parts of their findings could be applied to more diverse schools in which Mexican American families are part of the community population, but many of their findings are likely unique to the cultural makeup of this community. In particular, language and cultural barriers are likely unique to this community in which most families speak at least one of two languages, and operate under similar cultural expectations. In a more diverse community, I would expect to see parents who speak a wider range of languages that take more effort to understand and attend to. Family's cultural expectations regarding the school may also be more variable, and thus more time-consuming to fully understand.

All data in this study were collected at the elementary school level. This meant the findings were less transferable to upper grade level schools, especially when we consider that elementary school parents are typically a lot more involved than middle and high school parents. It would be worthwhile to examine what other types of barriers influence parent involvement at the high school level.

The author recorded meticulous notes and audio transcripts of interviews and observation sessions, and used a coding system to categorized emerging themes. Both of these actions supported the confirmability of this study. The author also used prolonged and persistent engagement, collecting data within the school over the course of a whole school year. Triangulation was evident, including a variety of different data collection methods, such as interviews, participant observation, and reviewing of records, to establish their results. The use of both prolonged and persistent engagement, and triangulation supported the credibility of this study and its findings. However, the author made no mention of utilizing peer debriefing, member checks, or progressive subjectivity. This was a concern because parents' feelings and opinions were interpreted by just one person, meaning they could be biased or inaccurate interpretations of culturally variable norms.

Given that many of these findings may be transferable to Mexican-American families that I will work with in urban public schools, I would be interested in exploring tools that will help me to conduct more frequent and accurate translations. In particular, I am interested in identifying strategies that will allow me to reach out to parents with limited literacy, like some of the parents profiled in this study. I found it striking that oftentimes such parents were too afraid to bring up issues of literacy or confusion with their child's teacher, and the teacher assumed that the parent was just disinterested in participating. This made me wonder if asking students what we, their teachers, should know about their parents, would be an effective strategy for overcoming this barrier. To be truly successful, it would need to be coupled with greater flexibility in the methods and tools used to communicate with families.

Pena's study (2000) was useful in identifying some of the sociocultural factors that influence the extent to which parents get involved in their child's education. Lareau & McNamara-Horvat (1999) examined a similar idea through their study that focused on parents' perceptions of their child's school given their racial or ethnic background. Using a qualitative case study methodology, the authors endeavored to identify common themes and relationships among parents' opinions of school personnel and policy.

The researchers gathered data through participant-observations, in-depth interviews of parents/guardians, teachers, administrators, and community members. It was unclear if they formally interviewed students. The authors also conducted a library-based research survey of news articles

related to racial issues within the town. The sample consisted of two 3rd grade classrooms at one elementary school. It was unclear if the authors chose these particular classrooms through random, purposeful, or convenience sampling. Within these classrooms, they chose a sample of 24 student subjects using maximum-variation sampling methods. Subjects included 12 white students and 12 black students, half boys and half girls. The researchers then interviewed the parents/guardians of these students in-depth. The authors also conducted interviews with teachers, administrators and other community members. They appeared to be using mixed methods to choose their participants for this portion of the study. They seemed to have chosen community members who were involved in the racial dialogue of the community, including the head of the local NAACP, and other local politicians. This suggested some criterion sampling.

The authors found that although most teachers felt that they were being equitable and neutral in their relationships with parents, in actuality they were more likely to communicate with parents that demonstrated a supportive, positive, and empathetic view of their teaching practice. This preference for positive parents negatively impacted black parents more than white parents. Black parents were more likely to interact with teachers and administrators with criticism and suspicion, especially in instances where they felt that the school was not sufficiently representing or teaching the black perspective. Teachers and administrators felt that such criticisms undermined their authority as educators and generally responded to these claims by ignoring or arguing with the parents. As a result, these parents became disproportionately excluded from involvement with their children's school.

The authors also assessed the parent/school relationship across socioeconomic status. They found that, although they were still suspicious of racism within the institution, black middle class parents were more likely than black poor parents to build strong positive relationships with the school. They were able to use some of their capital to seemingly code-switch, allowing them to express some of their concerns for their children in ways that white teachers and administrators were more comfortable with and more likely to respond positively to.

Lareau & McNamara-Horvat (1999) used prolonged and substantial engagement, persistent observation, and triangulation of methods to establish their study's credibility. They also demonstrated a self-awareness of the implications and barriers of the study. They stated, "Although the results of such an intensive case study cannot be generalized to a broader population, they can be used to challenge and modify conceptual models in the field" (Lareau & McNamara-Horvat, 1999, p. 40) This sort of language implied that the authors understood the limits in transferability of their findings, but were still able to identify purpose and relevance in their studies. Some key details about the methods used in sampling and data collection were left out, but the authors provided a sufficiently thick description of the racial context and history of this community, and included exact quotes and stories as shared by interviewees. This level of detail supported the confirmability of the study. It also suggested that the findings are worth considering in other communities in which teachers and parents may come from different ethnic or racial backgrounds, especially those in which parents come from historically oppressed backgrounds that may have a more negative opinion of educational institutions. Because the researchers conducted this study at an elementary school, it is less transferable to the middle and high school level. Relationships between parents, students, and school influx greatly as children progress through grade levels and those changing relationships are not reflected in this study.

In my own work as a teacher, I have often wondered if some of my perceptions and behaviors related to parents are more reflective of racial bias than I would care to let on. This study served to

demonstrate that even when teachers believe they are equally supportive of all parents, this is often not the case. As a teacher, it is my goal to build curriculum and classroom norms that reflect and support the unique cultural capital of all of my students. The parent participants in this study are proof that parents can be a valuable resource in helping teachers to recognize when curriculum or expectations are inequitable or discriminatory. It is then the responsibility of the teacher to listen to parents' concerns with an open mind and an genuine commitment toward improvement.

Patrikakou & Weissberg's research study (2008) established that there is no significant correlation between parent's sociodemographic identity, and their level of involvement with their child's education. But Pena (2000) and Lareau & McNamara-Horvat (1999) showed that there is nuance and diversity in the way parent's experience their child's education. If educators are to build effective and authentic relationships with parents and families, they need to build a better understanding of the underlying roles that race and status play in society. McKenna & Millen (2013) noticed a disconnect between teacher outreach strategies, and the realistic discernment of issues of equity. They used qualitative methods rooted within the transformative paradigm to explore this idea. They used grounded theory to examine current sociocultural issues that impair parent engagement with schools, and to build a new model for what parent engagement should and can look like in the modern world.

The authors used purposeful sampling methods that selected for participants who were likely to have a strong opinion and thorough understanding of the topic. Thus their sample selection focused on low-income parents who were already involved in parent education programs. The researchers chose participants from two local parent education programs. Their sample group consisted of eight mothers, six of which had children on a free/reduced lunch program. Five participants self-identified as African American. Three identified as Caucasian. All of the participants had multiple children in various local public schools.

The authors conducted background research on extant literature on parent involvement theories. They then combined the ideas of these theories with actual data collected from focus groups, individual interviews, and participant-observation. As a part of the participant-observation process, the researchers had parent subjects write letters to hypothetical teachers, in which they told them everything they thought their child's teachers should know about them, their families, and their child.

Based on parents' responses, the researchers found that most parents were strongly motivated to support their child's formal and informal education. They noted that a lot of this work goes on "behind the scenes", where teachers and administrators are less likely to notice it. Parents would have appreciated being asked to share more about what they do to support their child's education, both formally and informally. The researchers also found that many parents wished for their child's teacher to take the time to fully understand their child, both on an academic and personal level. Many parents wish that teachers would ask them about their child more often. While some parents are willing to share this information without being asked, many did not feel comfortable doing so, even though they would like to. All parent participants expressed the wish that teachers hold high expectations for their child.

The participants also expressed some frustrations with educators in the past who spoke to them as if they didn't know how to take care of their own child (for example, sending home contracts that instruct them to make sure their child gets enough sleep). They also spoke of a sense of distrust in schools that have consistently operated under the deficit model, in which they only see what their children don't come to school with, and don't give parents the benefit of the doubt that they're doing

their best. These assumptions make parents less likely to maintain involvement with the school and less likely to divulge information with teachers. The participants expressed the need for continuously open lines of communication with the teacher, not just during conferences or the beginning of the school year.

The authors utilized member checks, peer debriefing, progressive subjectivity, and a number of triangulation techniques throughout the course of their study. All of these methods supported the strong credibility of this study because they show that the authors took the time to ensure that descriptions were accurate and objective. Because of these measures, these findings can be considered trustworthy. The authors used an open coding model, and axial coding to categorize their data. This supported the confirmability of their findings, because it demonstrated that the emerging themes and patterns were not figments of the author's imagination. The data was there and McKenna & Millen (2013) provided a grounded interpretation of it.

Although the sample size was especially small, the authors' thick description of their data collection and analysis methods supported the transferability of this study. Although the perceptions of different individual parents were widely variable, many of the ideas and beliefs that were expressed by some of the parent participants could still be transferred to other settings, because the overarching themes spoke to issues of racial and cultural inequity that are present in almost all American schools. For instance, I found it incredibly interesting to read about how offended parents were by generic letters that were sent home reminding them to serve the basic needs of their children. This is something I wouldn't have considered as being offensive before. I would have assumed that parents that were already doing this would recognize the instructions didn't apply to them. I see now that the language of school literature such as this, can be incredibly offensive to minority and low SES parents, especially given the history of power imbalance and deficit model thinking within this country. I will absolutely take these findings to heart as I work to create a dialogue of respect and mutual support with the families of the students I teach.

**Summary and implications.** The findings from these research studies confirmed some of my understandings about the value of parent-school communication, and also extended my thinking in a number of ways. As McNeal (2012) confirmed, parent involvement almost always correlates with higher levels of student achievement and participation in school. Patrikakou & Weissberg (2008) also demonstrated a strong positive correlation between teacher outreach practices and parent involvement. These two studies validate the necessity of cultivating more opportunities and entry points for parents and families to engage in students' learning and progress.

However, it is not enough to simply reach out to parents in any way we feel is appropriate. As teachers, it is essential to communicate with parents in a way that speaks to their unique cultural and sociolinguistic context. In her study of one urban Mexican American community, Pena (2000) was able to convey some of the intricate factors that can influence a parent's ability to participate in their child's education. Pena noted common barriers for parent participation including language, parent education level, cultural influences, family issues and logistics, and the attitudes of school staff. These findings suggested two key ideas in terms of my research, which were corroborated by the findings of Lareau & McNamara-Horvat (1999), and McKenna & Millen (2013): (i) teachers need to put in effort to learn about parents, identify potential barriers to participation, and provide appropriate access given those barriers; and (ii) parents can read and interpret a lot about teacher attitudes and biases, even when they aren't explicit. As I considered the implications of these findings, it became more clear to me that in order for parent and family communication to be effective and equitable, it

needs to be centered in authenticity, caring, and respect.

Some of the findings in the research studies I analyzed left me wondering what else has been or can be uncovered in terms of research. One commonality that I noticed throughout my research was that most studies focused on parent's and teacher's opinions and perceptions. I was unable to locate any studies that examined students' perceptions of parent involvement. This is unfortunate because students likely have key insights into the benefits and drawbacks of parents involvement. They could also probably provide suggestions for communicating with their parents in a culturally responsive manner. For these reasons, I am interested in uncovering more research studies that examine parent involvement from students' perspective.

I also noticed that a lot of research has been carried out at the elementary school level. I had difficulty locating articles that focused specifically on secondary school settings. There seems to me to be a different dynamic in parent-school relationships, as well as parent-child relationships across and lower grade levels. Younger children typically need and get more parental support, so closer relationships with their school may seem more natural to teachers and parents. Adolescents often have a more complex relationship with their parents, and are transitioning to a time of greater independence. This shift in the parent-child relationship may also be reflected in the parent-school relationship, as parent's ideas of appropriate levels of engagement begin to shift. I would like to find more qualitative research that documents the nature of parent-child and parent-school interactions at the secondary level so I can gain a better understanding of how to support and cultivate these relationships as a teacher.

## **Academic Discourse**

*by Josefina Cullinane*

The second section of this analysis investigates the question, *what are the ways that students' linguistic backgrounds can be integrated with academic discourse?* This question relates to the larger research question of this paper, because it focuses on the effects of using strategies that incorporate students' funds of knowledge with new knowledge to create an equitable classroom. Communication is a central part of acquiring and gaining knowledge (Zull, 2002). This section of the paper considers the various contexts and approaches that promote an authentic environment that values and utilizes students' discourse-related funds of knowledge. It does so by (a) exploring how teachers identify the various communication networks, resources and relationships that students navigate between their peers, school and community members, and (b) examining how students use diverse communication skills, and ways of thinking and knowing, in order to learn academic language and skills that are essential to academic success.

In this paper, discourse refers to ways of knowing, reading, writing and talking (Moje, 2004). Language as defined in this paper includes multiple dialects of English based on cultural, ethnic, and regional origins, as well as languages other than English. A culturally diverse classroom is defined as a classroom that has a variety of students from cultural, ethnic, and regional backgrounds such as Native, African, Latino, Asian, European Americans, immigrants, and students from various socioeconomic backgrounds.

The search terms used in this investigation were; discourse, communication, funds of knowledge, culturally responsive, and culturally relevant. All studies were found using Ebsco Host

and JSTOR online databases. The studies used in this analysis were case studies, ethnographies and surveys. In conducting this research, it was difficult to find quantitative studies that specifically spoke to using discourse *and* students' funds of knowledge in the classroom. The resources available were also limited by the subscriptions available to the Evergreen State College through online databases and interlibrary loan. They explored elementary, middle and high schools in urban settings in the United States and Portugal.

The first study explored the emotional and academic impact of students who experience cultural discontinuity between their homes and school. The second study presented reflections of students who participated in a program that relied on students engaging in meaningful discourse in school. The last three studies explored how the specific learning contexts engaged discourse using students' funds of knowledge.

**Rationale.** My personal interest in exploring the ways that students' linguistic backgrounds can be integrated with academic discourse stems from my practice as an English language arts and English language learners teacher. The purpose of this study was to look for ways that students' languages and ways of communicating could be used as a resource rather than a cultural deficit in academic settings (Huerta, 2009). Communication is a key component of any classroom, because pedagogical decisions, such as oral and written assessments, are made based on these exchanges (Gay, 2010). In her study at a high school with a predominantly Latino student population and mostly white teachers, Valenzuela (1999) showed how teachers not knowing students' ways of communicating, relating, and creating knowledge led to the disenfranchisement of the students and left them vulnerable to academic failure.

The way that students' home culture organizes the processes of communication correlates to how they organize knowledge. Lewis (2007) stated that student success in schools is based on more than individual efforts and includes "economic, social, cultural and symbolic capital" (p. 5). Understanding and using multiple communication styles in the classroom is a way of being culturally responsive to students' needs and building students' capital. Culturally responsive teachers acknowledge the linguistic backgrounds of bilingual and bidialectal students and use them as a resource and vehicle to convey intellectual abilities (Gay, 2010).

**Review of the literature.** Arunkumar et al. (1999) sought to explore the emotional and academic effects of home-school discontinuity on students in southeastern Michigan. In this correlational study, the researchers administered surveys to students in fifth grade and again in sixth grade, in order to measure the effect of high and low home-school dissonance on academic achievement and emotional well-being. Their results revealed that students who had higher home-school dissonance were more likely to exhibit poor emotional and academic well-being. Although this study did not specifically speak to using discourse in the classroom, it demonstrated that students who lack meaningful connections at school in relation to their funds of knowledge may be susceptible to academic and emotional problems.

The researchers' rationale in conducting this study was in response to other academic research. There are a number of studies that show that students who experience high levels of dissonance between their home and school, often demonstrate lower academic performance. This is often rooted in the fact that the dominant beliefs, values and behavioral expectations expressed by school institutions are not compatible with the home cultures of students. However, the researchers noted that there is also data that suggests some students demonstrate lower performance levels even when they describe their home and school realities as culturally congruent.

The researchers had four hypotheses: first, that African American students experience high levels of home-school dissonance, second, that students who experience higher levels of dissonance have negative perceptions of themselves and have lower grade point averages than students with lower dissonance, third, that students who experience a high level of dissonance experience more negative patterns of change in their emotional and academic well-being when they advance from elementary school to high school, and finally that experiencing higher or lower dissonance has a stronger relation to changes in emotional and academic well-being in African American students than European American students.

At the time of this publication this correlational study was ongoing, with the goal to examine the emotional and academic well-being of students as they moved from the fifth grade to ninth grade. The researchers collected this data with a series of surveys that were administered to students in 18 elementary schools in three economically and ethnically diverse school districts in southeastern Michigan. The surveys were administered in the spring of their fifth grade year and again in the spring of their sixth grade year. Trained research assistants administered the surveys in two 40 minute sessions. The majority of the research assistants were European American, with some who were African American and some who were from other countries (New Zealand, Israel, India). The students were assured that the survey was not a test and would be kept confidential.

The researchers used a 5-point scale to measure the results of 475 students. They selected students from the top and bottom third of the distribution of the scale. They used a chi-square analysis to determine that there were no significant differences in the representation of boys and girls, and African Americans and European Americans in the high and low dissonance groups. They also determined that there were no significant differences in the representation of students who received free or reduced lunch versus those who did not.

The surveys were comprised of a series of questions asking students about home-school dissonance and emotional and academic well-being. The students' hopefulness about the future was measured on a "Hopefulness Scale", developed by the research team. Self-esteem and self-deprecation was measured using the Rosenberg Self-Esteem Scale. They measured anger with the Symptom Checklist-90 scale. They measured self-efficacy using a Patterns of Adaptive Learning Survey and school records of student information. The researchers also measured students' grade point averages (GPA), and whether they qualified for free or reduced lunch from school records.

A total of 546 students participated in this study. Because there was a small number of Native, Latino and Asian American students who participated, the researchers did not have enough data to compare across each ethnic group. They focused their data on African and European Americans, which was a sample of 475. Students were required to provide signed permission slips from families to participate; 83% received permission.

The results showed that students who had higher levels of home-school dissonance were more likely to exhibit poor emotional and academic well-being. The researchers did not find any significant differences in the extent of home-school dissonance between African American and European American students. However, they did find that there were significant differences between students who experienced high levels of dissonance and students who experienced low levels of dissonance. Overall, the students who reported high levels of home-school dissonance "were less hopeful, more angry, had lower self-esteem and were more self-deprecating, felt less academically efficacious, and had a lower average GPA than students who were in the group that experienced low or no dissonance" (p. 453). Additionally, the researchers found that both ethnicity and year had main

effects on anger and GPA, showing that African American students were more angry and had lower GPA's than European American students. As a whole, students were less angry and had lower GPA scores after they moved from the fifth grade to the sixth grade.

The researchers attended to internal validity through training the research assistants to ensure that the surveys were administered the same way. They also tested the questions on the survey on a pilot group and revised their surveys based on their comments and questions. The researchers did not say it explicitly, but they seemed to use a convenience sampling of the population. Although they chose three working class school districts that were ethnically and economically diverse, the lack of randomization with the selection limits whether or not these findings could be generalized to specific groups of students (e.g. African American, European American, boys, girls).

The importance of emotional well-being to academic success is substantiated by neuroscientific research regarding how people learn. Zull (2002) explained the importance of emotion in learning, and the fact that the brain relies on the emotional centers for growth. This study highlighted the importance of emotion and connection between home cultures and school cultures in the classroom, which made me wonder how language discontinuity could impact students' emotional and academic well-being. Further research that examines cultural discontinuity students experience in the classroom when learning and engaging in academic discourse would help me understand the effects this has on their academic and emotional well-being. An important aspect of this study was that the data focused on students' perspectives of their experience of cultural discontinuity. Further investigation that prompts students to describe their experiences of cultural discontinuity and/or continuity could reveal what kinds of discourse strategies seem to accommodate using students linguistic funds of knowledge.

While Arunkumar et al. showed the academic and emotional effects of home-school discontinuity, César and Oliveira (2005) used transformative research to help students gain a deeper understanding of themselves in the context of educational achievement. Through an action-research project that sought to make meaningful connections to students' lives, researchers showed the perceptions of students regarding an alternative program that relied on student interaction and collaboration. The study revealed that students saw the value and difference that the alternative program provided them. They appreciated the reliance the program placed on social interactions, trust, being a participant of the community, and collaborating. The students were not able to remember specific tasks or learning activities that they engaged in during the program, but remembered that the overall culture of the classroom relied on mutual help and communication of different points of view, which was different from their regular classes. By the end of study the students had developed a critical perspective of school, and a greater sense of self-reflection on the practices and impact of collaborative teaching. In the true sense of transformative research, the participants gained a deeper understanding of themselves in the context of educational achievement.

The results of this study described the perspectives of students through an interview process. The specific questions that were used for the interviews were: (i) How do students talk about the experiences they had? Which aspects do they remember? (ii) What impact did these experiences have on the way they view school? How do they perceive academic learning? (iii) How do they see their future? Did having this curricular experience influence their working lives as they see it?

César and Oliveira's (2005) rationale for investigating this study was that the current state of public schools in Portugal marginalized students whose linguistic backgrounds were viewed as a deficit. The researchers went into this project with the goal of tackling the issue of underachievement

and drop-out rates, especially among students from whose first languages and ethnic backgrounds were from places other than Portugal (e.g. Africa, Eastern Europe, Latin America, Macao, China, India, Timor). They worked with select teachers who sought to create inclusive curriculum in previous practice to participate in this project.

This action-based research project lasted one year. The data presented in this article included follow-up interviews that were conducted three years after the project was completed. Data were collected through participant observation, interviews, questionnaires, teacher's planning notes, and student work. The data analysis was interpretative, based on inductive categories developed by the researchers. These categories are based on interview questions that aimed at understanding what the inclusive program meant to students and how it impacted their futures. This study was an ethnographic study that used a transformative paradigm.

The researchers used criterion sampling to identify students who came from culturally diverse backgrounds, and experienced a disconnect between school and their lives. This article focused on a group of five students who were in one class that implemented the alternative curriculum. The whole class consisted of 15 students, ages 12-16, who attended different classes in previous years of the study. These students were characterized as having low expectations for academic success and no life plans for the future. All of the students from the whole class had repeated grades at least once and up to four times. The five students (2 boys, 3 girls) had a variety of outcomes three years after the program; one attending evening school, one married and working, one completed the 9th grade, one working who completed the 7th grade, and one who worked and was in the 8th grade.

The researchers attended to credibility by involving themselves with the development of this curriculum at the time it was proposed, and in the following three years after its implementation. This prolonged engagement showed that the researchers did not make premature conclusions based on limited data. The researchers did not state whether the interviews were audio recorded. However, they did provide direct quotes of students' answers to interview questions. Although they used students' perspectives as the data in this study, their analysis was partly based on interpretation on the researchers' part. After each excerpt quoted, the researchers provide further context and an analysis of students' responses. They did not indicate whether or not they checked the accuracy of their perceptions with the students, which would have strengthened the credibility of their data.

The five students selected for this article all had negative perceptions of themselves as students. All students had repeated grades prior to the study and were considered at risk of dropping out of school. These students experienced poverty and cultural discontinuity between their home and school cultures. The researchers provided a table that outlines the characteristics of the participants, and used special coding in the excerpts from the interviews to identify the participant, the year the interview was conducted, age, school grade and job they held. This thick description attends to the transferability of this study, because it provides enough information that I would be able to understand students' perceptions within the context of this study.

The results of this study revealed that students could name the importance of discourse and collaborating with their peers when they were invited to do so. In this class the format of the academic discourse was student-centered, where students' ideas and input became a central resource for learning. The researchers indicated that they held meetings to collaborate throughout the program. This collaboration between with teachers, researchers, school psychologist and parents seemed to be a key component of understanding students' behaviors and guiding them toward mutual understanding and respect in the classroom. For example, there were episodes of disagreement that manifested in

physical and verbal aggression in the class. When the psychologist joined the team they made changes to the program to develop social skills. The researchers noted that most of the participants noticed an increase of respect and acceptance of others after the changes were made. This makes me wonder about the importance of integrating social skills in curriculum that emphasize respect and tolerance in my future practice. It also leads me to speculate if collaboration with colleagues and families would support me in developing a classroom culture that relies on collaborative learning and interpersonal communication. A guiding practice this implicates is the importance of modeling and teaching how to honor all linguistic backgrounds while learning and engaging in academic discourse and including parents, teachers, psychologists and any other specialists that are available and applicable to the situation would be a good use of resources. Further research that investigates the effects of teaching social skills and collaborating with colleagues and families would further illuminate if these principles are worth using in my future practice.

While César and Oliveira's (2005) study showed how students who were at risk of failure responded to an inclusive alternative project, Morgan's (2010) explored the effectiveness of another alternative program that utilized students' funds of knowledge. This ethnographic study showed how teachers in an alternative school created a third space for students to use their linguistic funds of knowledge. Morgan's study focused on a 10th and 12th grade English language arts class in an alternative education classroom in the United States. This study revealed that participants were able to use the blog for different purposes, and had a high level of fluency in the academic discourse qualities of writing online (e.g. context, form, content, technique). They also demonstrated students' adaptability within this context when the teacher changed the purpose for writing on the blog in the second year of the study.

The theoretical frameworks included in this study are third space theory, cultural capital, and digital capital. Third space theory refers to an alternative space that "merges the meanings, knowledges, and practices of the first space of home, peer networks, and communities" with those of second space (e.g. school, work, church) (Morgan, 2010, p. 222). Third space is a physical space that brings together meanings, knowledges and practices from the first and second spaces through discourse. Morgan argued that third space could exist virtually, since it facilitates students in negotiating their identities in the first and second space and the disparities between spaces. Cultural capital and digital capital refer to the manifestation of practices, actions and dispositions that include digital abilities and skills that are utilized and valued in institutional settings. Within these lenses, the researcher's goal was to find out how students shaped their identities, and the effects of student online literacies on pedagogy.

Morgan (2010) focused her research on examining how students' online literacies affect pedagogy and students, and how knowledge of that role could be put into use in the classroom. Her rationale for this study was that students spend a substantial amount of time on the internet in their daily lives and that teachers would be remiss in not looking for ways to integrate this into learning academic knowledge and skills. This study explored how students navigate between new literacies (technology based) and old literacies (paper based) for academic, economic, and social purposes at school, work and home. The way that students engage communicate through new literacies directly speaks to both their linguistic funds of knowledge and provides a space for them to engage in discourse.

This was a qualitative study that took place over the course of two years. The researcher worked with one teacher to design and implement the curriculum. Her data sources included

examples of students' work, field notes, teacher interviews and an online survey conducted in the second year of the study. She used criterion sampling to select three "telling cases" that represented "the best illumination of student engagement with new literacies" (Morgan, 2010, p. 224). The three telling cases included two 17 year old white males and one 18 year old white female; all enrolled in the 12th grade class.

The students wrote blog posts and comments to fulfill assignments in an English class. The content of the blog posts and comments were analyzed using multimodal methods and were coded as cases. The cases were analyzed for patterns and meaning relating to the theoretical frameworks that the researcher used. The participants in this study include 66 students in an alternative classroom and one teacher. The participants attended this alternative school because regular academic education was not serving their learning needs. The researcher also selected 91 control subjects who were used to test the blog and for maintenance purposes. These subjects were students from the researchers graduate classes.

The teacher set up a blog for students to use as an online response journal that they could use as reflection about the literature they were reading. The students were allowed to create their own screen names and customize the look of the blog based on their liking. The teacher provided prompts and the students were to respond to those prompts in the form of blog posts. In the second year, the teacher changed the format to be more about students writing about themselves and utilizing their digital skills through the use of special features (e.g. podcasts, images). The students followed the teachers' assignments and used the blog as a way to construct their identities.

Students demonstrated knowledge and competency digital skills that weren't traditionally honored in school (e.g. gaming, knowledge of films) and used the blog to discuss larger issues that affect their identities. For example, one of the students wrote about not being able to donate blood for the American Cross because he identified as homosexual. The third space provided by the blog facilitated his ability to discuss the larger institutional structures that affect his identity and the discrimination he feels. Another student used her personal experiences as a woman to discuss the larger patriarchal structures she experienced and to develop her ideas for her senior paper. The blog was used as a way to connect their writing to their lives and experiences.

The researcher spent two years with the students. This included many hours spent in the classroom, and online with the students. This level of prolonged engagement and persistent observation increased the credibility of this case for me because it means they took into consideration the larger context of students' experiences. Morgan (2010) also engaged in member checking with a team of researchers who organized the data into cases and analyzed them within their theoretical framework. The discourse analysis of the blog post interactions were analyzed using multimodal methods. Most of the data is online, which makes it easily trackable and confirmable. When the teacher changed the focus of the blog, the researcher tracked these changes and noted the features of the blog posts that showed that the students still displayed a sophisticated understanding of composition. This helped me to follow along with the logic of the findings and understand that they were logical.

Although the author provided detailed descriptions and explanations of the three participants, there are caveats to whether the results are transferable. Morgan (2010) selected the three students in order to provide a closer look at how students effectively engage in new literacies. They already had digital and cultural capital and had a similar socio-economic and racial background, academic history, and online experience. These students may have learned how to use their digital and cultural capital

while other students may have had the potential, but didn't know how to use it or didn't feel comfortable using it. Further study into how to support students in recognizing the digital and cultural capital that they have would help me to understand whether or not this would be a valuable practice to bring into my classroom. For example, if students have never been given the opportunity to explore institutional or societal issues at their own free will, it seems that I would need to first build trust with my students and then help them to express issues that matter to them the most. Additionally, further study into how to differentiate technology literacy in the classroom would support me in knowing how to help students to use their digital capital to create a third space in the classroom.

The implications of this study for my classroom made me think about how I could identify the economic, social and institutional barriers that prevent students from having access to digital capital. Ito et al. (2008) emphasized the importance of social media and recreational activities online, identifying them as the jumping-off points for experimenting with digital media creation and self-expression. In my future classroom, I will look for ways that I can support students in having access to the tools to engage in this important third space.

Fitts (2009) conducted a yearlong case study in a fifth grade class made up of English-dominant students and Spanish-dominant students in a dual-language elementary school in the western United States. Her main goal was to examine places and moments in which students' funds of knowledge, and cultural and linguistic practices were integrated into academic tasks and curriculum. This study revealed that teachers; (i) made connections using students' funds of knowledge and experience to bridge new learning, (ii) allowed students with different dominant languages to model different types of discourse styles to their peers, and (iii) highlighted linguistic skills that were traditionally marginalized.

Fitts (2009) used "communities of practice" and "third space" as theoretical lenses for her findings. Communities of practice (CofPs) refers to spaces where students have shared communication tools and discourse practices that facilitate students in developing particular roles and identities over time. Third space refers to spaces where "discourses, genres, and texts come into dialogue and transform one another, creating new, hybrid CofPs" (Fitts, 2009, p. 90). The author's rationale for focusing on culturally responsive pedagogy was due to the observation that there were limited examples in the field of what culturally responsive teaching looks like. This study presented examples of exchanges where teachers used students' funds of knowledge and strengths as a resource for academic tasks.

The participants in this study were in a fifth grade class made up of 52 students with two teachers in a dual-language school. These students had been together in this school for five years, starting in the first grade with 90% Spanish instruction and 10% English instruction. Each year the ratio of instructional time in Spanish decreased until it was 50:50 in the fifth grade.

Fitts' (2009) attended to credibility through collecting her data from a diverse set of circumstances and sources. Her data sources included field notes, audio files, interviews, survey and observation notes. She also visited the class three to four times a week at different times of the day and in a variety of settings. She says she used triangulation to check her data collection and analyses, however there was no description of how she triangulated her data or details of the sampling method. Fitts noted that this study was part of a larger study, and additional testing of the credibility could be obtained by examining her earlier publication.

There are three examples presented in the findings of this study that illustrate the themes found throughout the research. The first example revealed that the teachers used students' funds of

knowledge to introduce new concepts and build students' background knowledge in a large classroom discussion, but failed to attend to the discourse format and style, and how it marginalized certain students from participating in the discussion. In this example, the teacher related the concept of statistics to sports that students had prior knowledge and interest in, but the students who were asked called on weren't engaged in the discussion because they didn't have enough scaffolding provided to help them engage in the format of the discussion. The second example revealed that the teachers used students' linguistic funds of knowledge to create a third space that allowed them to demonstrate competency in more than one discourse context. In this circumstance, a Spanish-dominant student exhibited alternative rhetorical styles in her speech than her English-dominant peer, which led the students engaging in a classroom discussion about the differences between the two styles. This third space allowed students to model different discourse styles to each other. The final example in this study revealed that the teachers positioned the Spanish-dominant students to be experts in the class through a discussion about code-switching. The teacher validated the Spanish-dominant students' strength in this linguistic form through the use of literature, writing and classroom discussions. This example also allowed the Spanish-dominant students to act as models to their English-dominant peers, while engaging and teaching all students competency in this discourse practice.

Although the findings in this study illuminated how the teachers successfully created third spaces and CofPs through using students' funds of knowledge and discourse patterns, Fitts (2009) attended to dependability by making it clear in her conclusion that these circumstances were limited throughout her observation. She stated that the teachers and school consistently reinforced privileged styles, texts, and ways of knowing, which were culturally responsive to the Anglo students in the class. Nevertheless, her findings provide ideas and strategies for honoring students' linguistic funds of knowledge while engaging and teaching them academic discourse.

Fitts (2009) provided thick descriptions of the data in her three examples and provided a context by explaining the progression of this dual-language program. In the first example, the teacher used students' funds of knowledge and experience to bridge new learning in whole-class discussions, but didn't attend to the access and barriers implicated in the choice of discourse format and style. This example provided me with the idea that relating concepts to students' funds of knowledge is only the first step to being a culturally responsive educator. They weren't able to be metacognitive with the concept the teacher was trying to introduce because they lacked competency in how to navigate the Initiation-Response-Evaluation (IRE) format that the teacher routinely used. This example highlights the importance of knowing students' access points and barriers with discourse in the classroom. This involves getting to know the students' linguistic backgrounds and reflecting on my own practice, preferences and biases.

The two examples that accommodated the Spanish-dominant students to act as models for their peers provided insight for me into how I could create a third space in the classroom. In the second example, the teacher guided students in applying their discourse style to another context by comparing a rhetorical style used in one student's speech with another student's speech that was on the same subject. In the third example the teacher highlighted students' use of code-switching as a linguistic strength and resource and made connections to this discourse style with literature and writing. These examples underline the importance of knowing students and using their linguistic funds of knowledge as a resource for learning. In addition to providing a way to elevate the status of marginalized students in the classroom, guiding students in being able to articulate the connections they notice between one context to another accommodates their ability to acquire different discourse

practices and competencies. This also sheds light on the application of culturally responsive pedagogy and the necessity of engaging students in complex intellectual tasks (e.g. analyzing, evaluating) rather than naming or describing (Gay, 2010). Further research that investigates specific strategies that supports students in engaging in complex thinking processes and require students to use their linguistic backgrounds to make meaning would help me to identify specific ways to use their funds of knowledge with academic discourse.

While Fitts' (2009) study showed students' use of different discourse patterns through speaking in a dual language program, Wiseman's (2011) ethnographic study explored the use of discourse with poetry. This study took place over the course of a school year in an eighth grade English classroom in an urban middle school in the United States. This study revealed that poetry accommodated students in deep reflection about their identities, future, and emotions, allowed them to explore ideas with peers, and use and understand sophisticated poetic and literary conventions. Students regularly made connections to their linguistic funds of knowledge and experience.

Wiseman (2011) focused her research on the question, *How do students participate in classroom poetry workshop led by a community member that builds on their experiences and knowledge in various contexts?* Her rationale for this study was that poetry provides a vehicle for creating meaningful educational experiences because it involves creative language, and multiple perspectives. Since poetry requires students to draw on their life experiences and understandings, poetry can enhance students' educational experiences and literacy learning. Wiseman's main goal for this study was to show the effect of creating spaces for critical thinking using students' languages, ways of thinking, and experiences as a resource. She wanted to demonstrate how the classroom space was transformed in this circumstance to become a third space where students saw the relevancy in what they were learning to their lives.

The data for this study was collected through classroom observations, which averaged twice a week, in both the poetry workshops and the regular English class. The observations and interactions were recorded as field notes and audio recordings. Wiseman also held focus group sessions that included five students that the teacher pointed out as particularly representative of students in the class based on race, ethnicity, academic success, and interest in the poetry workshops. Four group interviews were held with other students who were interested in participating in the study more closely. Additionally, she used student work and audio recordings of the group interviews and class discussions for her data analysis.

The participants in this study included 19 African-American students, two Hispanic students, and one Asian-American student; nine males and 19 females. The school is located in a large metropolitan city on the East Coast in a historically African-American neighborhood.

Wiseman (2011) ensured credibility of her data through prolonged involvement in the classroom, collaboration with research participants and using varied types of data. She used triangulation and member checking by comparing her data with the focus groups, group interviews and classroom observations to confirm her data analysis. The sampling method was not described in this study, but because it is part of a larger study, credibility could be further tested by looking up her earlier publication.

The author used thick description and understanding of the context in order to ensure transferability. She attended to dependability by audio recording interactions. Through using a variety of methods for data collection, she verified that her data was dependable.

Because of the nature of poetry being an artform that relies on students using their language

and experiences, further research is needed to see how transferable the principles of this program would be in other subjects and contexts. Wiseman (2011) described how poetry accommodated students in using their own language practices to convey their ideas, experiences and opinions. It would be valuable to compare the quality of other literacy programs and content areas with the qualities of poetry and see if there was a way to reproduce similar results. In this particular program, the teacher invited an African-American community member to facilitate the weekly poetry workshops. He worked for a non-profit organization that served families impacted by poverty and as a youth director for another community organization, which fostered positive rapport with the students. It seemed that he was instrumental in the success of the poetry program. Because of this unique and powerful dynamic his presence created, it would be valuable to me to consider the role that community members could play in the classroom as bridge for creating a third space. Further research that investigates the use of input and participation of community members and families in the classroom would help me to understand the complex nature of merging students' home languages and discourse practices with those of school. Additionally, the use of a community member who had pre-established trust and respect with the students makes me wonder about strategies that I could use to create this dynamic in my own classroom, with or without the use of community members and families.

This study revealed how poetry can be used as a tool for students in creating a third space in the classroom where they integrate their linguistic funds of knowledge from home with academic discourse learned in school to create a hybrid space for literacy formation. The use of a community member to help facilitate students in building academic discourse while using their funds of knowledge draws attention to the positive academic and emotional impact potential of integrating community and families into the classroom.

**Summary and implications.** Arunkumar et al (1999) and César and Oliveira's (2005) studies did not speak to the ways that students' funds of knowledge can be used with academic discourse in the classroom; rather, they spoke to the academic and emotional impact that cultural discontinuity had on students. Students' linguistic funds of knowledge are an important part of their home cultures, which leads me to wonder if students' home cultures are not represented in their school lives, then they might be vulnerable to academic failure. Further research that measures the academic achievement of students before and after their linguistic funds of knowledge are integrated into academic discourse would help me to understand whether or not students would benefit achievement-wise. This would be useful to my question because it would help me to validate the use of a Funds of Knowledge framework in my curriculum as a valuable endeavor. Additionally, further investigation that explores how students feel when their linguistic funds of knowledge are used for engaging and learning academic discourse would help me understand how important it is for students to have their linguistic backgrounds integrated in academic discourse. This would be useful to my question because it would might give me ideas on strategies for getting students' input on how they expect and hope their linguistic funds of knowledge are valued in the classroom. A research project that uses students' input with reflective interview questions in the same manner that César and Oliveira's (2005) study demonstrated, by asking students about the impact it had on their lives, could potentially lead to creating a stronger research project for investigating strategies that attend to students' emotions.

Two of the studies in this review focused on students who were at risk or in an alternative school setting (César and Oliveira, 2005, Morgan 2010). Both of these studies revealed that students

who were traditionally marginalized benefited from more inclusive pedagogy that sought to integrate their funds of knowledge in meaningful ways. In César and Oliveira's (2005) study, students who were not native speakers of Portuguese and whose home cultures were minoritized in their school setting participated in an action research project that centered around students having mutual respect and being supportive of each other's ideas. In Morgan's (2010) study, students who were enrolled in an alternative school used the class blog as a third space to explore their identities and make connections between paper-based literacies with technology-based literacies. It would be valuable to my research question to do further research across a randomized population of students to show a wider range of the effects of using students' funds of knowledge with academic discourse. This would be useful to my question because it would help me to understand the effects of using students' linguistic funds of knowledge with students in various contexts.

A practice that I am walking away with is getting to know my students and being intentional about learning their linguistic backgrounds. This is an important first step to using a Funds of Knowledge framework in my practice (Gonzalez). This also requires me to be reflective on my preferences and biases for communication in the classroom, and willing to make the necessary changes that will serve my students (Gay, 2010). I will reflect on my own perspectives of what discourse should look and sound like and revise my teaching practices based on my students' needs and funds of knowledge. This will require me to observe and inquire into my students about their discourse practices.

These studies also revealed the importance of metacognition with students engaged in academic discourse while using their linguistic funds of knowledge. Students need to be given the opportunity to engage in complex intellectual tasks with their linguistic funds of knowledge. This means analyzing, evaluating, synthesizing, comparing, etc using their linguistic backgrounds (Gay, 2010). This was demonstrated in Wiseman's (2011) study where students wrote poetry about their lives while exhibiting sophisticated use of poetic moves and devices. It's important for students to learn the academic language of school in order to be successful, and I plan to guide students to do this while honoring their home languages. Further investigation into different contexts where students were engaged in complex intellectual tasks while using their linguistic funds of knowledge could provide more examples to my research question and help me to gather ideas and principles that I could use in my future practice.

Three of these studies in this review (Fitts, 2009; Morgan, 2010; Wiseman, 2011) used third space theory as a framework, which indicated that in order to make use of students' linguistic funds of knowledge with academic discourse, teachers need to look for ways to create a third space in the classroom. Creating a third space in the classroom can be done in a myriad of ways depending on the class and content. Third spaces described above were created through blogs, poetry, and dual language programs. In my future research and practice I plan to look for ways to develop students' academic language while honoring their home languages to create a third space. The guiding questions that I will ask myself will be: (i) What does a third space in the classroom look like? and (ii) How are students benefiting from the third spaces that I create in the classroom?

## Collaborative Learning

by Emily Newton

Within this subsection, I analyze research related to group work and achievement for culturally and linguistically diverse students. In my research and analysis, I aim to answer the specific question, *what are ways in which students' funds of knowledge can be incorporated into collaborative group work to improve achievement?* As part of this larger analysis, this subsection speaks to specific instructional strategies that can be seen as avenues within the classroom for eliciting and engaging students' funds of knowledge. In my analysis, I focus specifically on opportunities, mentioned either explicitly or implicitly within the studies, for incorporating students' funds of knowledge into collaborative learning experiences. Within the context of culturally responsive teaching, collaborative learning appears in the professional literature as an effective teaching strategy (Gay, 2010; González, Moll, & Amanti, 2005).

When I first began searching for relevant studies, I used references to studies and researchers mentioned in *Culturally Responsive Teaching* (Gay, 2010) and *Funds of Knowledge*, (González, Moll, & Amanti, 2005), and various literature reviews. After securing copies of relevant studies through the use of the online academic databases, I was able to use the reference lists within the studies to find examples of additional studies that focused on the different components of my research question. Using keywords and specific terms to search directly within the databases was less effective than searching for specific studies or researchers. In conjunction with variations of “culturally responsive teaching” and “funds of knowledge,” I used the following search terms to locate relevant studies: “group work,” “collaborative,” “cooperative,” or “communal learning,” “participatory structures,” “context,” “achievement,” “culturally or linguistically diverse.” The majority of the studies that I found were quantitative studies that looked at the effectiveness of group work versus traditional instruction on academic achievement for specific groups of students. I was able to find studies that spoke to the cultural congruency of collaborative learning for certain target populations, but I was unable to find studies that explicitly investigated culturally relevant group work tasks or discussion topics. Overall, the studies I used for my analysis pointed to group work as an effective instructional strategy for improving academic performance for culturally and linguistically diverse students.

**Rationale.** While drawing on students' skills, abilities, and experiences acquired outside of school in order to bridge their funds of knowledge with curricular content is central to the pedagogical framework of FoK, it is also important for teachers to consider ways to incorporate these skills into the learning context itself. In particular, the participatory structures within a classroom, such as independent, whole class, or small group work, have a large impact on students' participation and access to learning. In their outline of suggestions for culturally responsive educational reform, González et al. (2005) hypothesized that cooperative learning may be an effective instructional innovation because it “may be more compatible with the cultural norms and values of U.S-Mexican children, and it seems highly compatible with their learning experiences. Second, it may contribute to their interethnic relations in the classroom” (p. 66). Research suggested that there was a strong difference in context preference between Anglo students and African American and Latino students, for example. While Anglo students preferred and succeed in competitive, individualistic learning environments, African American and Latino students preferred and achieve greater when involved with collaborative learning groups (Allen et al., 2005; Trueba & Delgado-Gaitan, 1985).

The purpose of this review was to analyze relevant research about group work in order to uncover ways to design and incorporate effective and culturally responsive group work into future practice. Gay (2010) highlighted collaborative learning as a culturally responsive instructional strategy, and she emphasized that “underlying values of human connectedness and collaborative problem solving are high priorities in the cultures of most groups of color in the United States,” and “cooperation plays a central role in these groups’ learning styles, especially the communicative, procedural, motivational, and relational dimensions” (p.187). Collaborative participatory structures can disrupt the competitive culture of classrooms and mirror students’ cultural learning styles.

Given current research on learning theory, collaborative group work may provide opportunities for students to engage with important concepts and content by connecting new information to their existing schema and testing out their new ideas through discussion or hands-on experiences (Zull, 2002). Collaborative learning generally involves more sensory input and active engagement than direct instruction, and students may be developing or strengthening more neuronal connections needed for deep learning during this time (Zull, 2002). For these reasons, I think that the interactive nature of group work is important for all students’ learning. I frequently facilitated group work labs and activities during my student teaching, and I noticed that classroom engagement seemed to increase overall, but not every student necessarily had equal access to the materials, discussion, or content shared by the group. Deepening my understanding of collaborative learning and ways in which students’ funds of knowledge can be elicited and celebrated within instruction will help me to develop a more responsive practice that supports learning for all students.

**Review of literature.** Each of the studies I chose to review looked closely at collaborative learning contexts and effects on students’ academic achievement. The first three studies focused on the verbal and social effects of collaborative learning for students, in addition to achievement. These studies were interested in the interactive nature of group work and illustrate examples for how the content used within group work encouraged participation and verbal behaviors, thereby increasing access to learning. The purpose of this review was to highlight opportunities for drawing on students’ funds of knowledge within effective group work. The remaining two studies focused on the cooperative nature of group work itself and look for parallels between students’ cultural modes of learning and the academic contexts for learning. These studies see the group work itself as an entry point for students, regardless of content. This analysis focuses on these two emergent themes.

***Collaborative learning: social and behavioral implications.*** Cohen and Lotan (1995) were interested in investigating the relationship between the use of status treatments and participation of low-status students within heterogeneous learning groups. In Cohen’s previous studies, she noticed that students’ perceived academic status impacted their access to leadership and learning opportunities within mixed-status groups. Because high-status students tended to participate more than low-status students, Cohen and Lotan were interested in developing an equal-status classroom through the use of status treatments. This particular study involved collecting and analyzing classroom data to determine if status treatments were a predictor of the correlations observed between students’ status and participation within collaborative group work. Their study revealed that participation rates increased for low-status students and were not affected for high-status students when teachers used status treatments during group work. They also found that all students were more likely to participate when the average classroom participation was higher.

The two types of status treatments used in the study were (i) multiple ability treatments and (ii) assigning competence. When teachers and students discuss the variety of skills, understandings,

and competencies required to perform a given task, they are providing a multiple ability treatment. Assigning competence happens when teachers evaluate students' use of relevant skills, thereby highlighting their contributions to the group and elevating their status in the eyes of their peers. I am especially interested in using the study to think about how teachers could draw from students' funds of knowledge (i.e. skills, understandings, experience with related content or concepts, etc.) when highlighting multiple abilities in the classroom as a way to elevate status and provide access to learning for all students.

The researchers used stratified sampling to identify a subset of students within each of the 13 classrooms that took part in the study. The classrooms were from three different schools in the San Francisco Bay area and represented Grades 2-6. In each class, the researchers surveyed students to determine the academic and peer status of their classmates. From these ratings, the researchers chose small groups of 14 students to observe in each class: all students who scored the lowest and highest scores, and then a random selection of students who scored close to either end of the status spectrum. In total, they collected data from 61 low status students and 67 high status students.

Trained observers tallied the number of times that teachers used status treatments within a ten-minute window during each observation period, and also measured how often the target students made cooperative or on-task comments during group work. After analyzing the data from their teacher and student observations, the researchers found that high status students participated at a significantly higher rate than low-status students and teachers used an average of fewer than 1 status treatment for every 10-minute observation.

Using a regression analysis, the researchers determined that the more frequently a teacher used status treatments, the more frequently low-status students participated. The data also revealed that status treatments had no effect on the participation of high-status students, even when they personally received the treatment of "assigning competence." Interestingly, the strongest predictor of participation amongst low status and high status students was the average rate of interaction in the classroom. Classrooms with a higher rate of overall interaction exhibited increased participation from low and high status students.

Part of the challenge of determining the internal validity of this study lies in the fact that the two status treatments were used with all individuals, not just low-status students, as intended. Because the treatment fidelity was compromised, it will be difficult to know how low-status students would have responded if they were the only ones to receive status treatments. That being the case, these findings can be generalized to similar groups of students who receive the same frequency of the treatments, indiscriminate of their status. Because the participating students were identified based on their status, the samples may not be representative of the range of status distribution in a typical classroom. Also, the sample size became smaller than recommended for a correlational study after the researchers eliminated an outlier (Mertens, 2010, p. 331). Additionally, the findings cannot be generalized to older students because it can be assumed that factors affecting classroom participation become more complex as students age. Instead of looking at the effect of each type of status treatment on students' participation, the treatments were combined into one independent variable during the analysis. This makes it difficult to know whether the multiple ability treatments, assigning competence, or both treatments had an effect on students' participation. However, it was clear that the more that participation was encouraged in the classroom overall, the more frequently low and high status students made collaborative and on-task contributions.

As a classroom teacher, I would be interested in looking at the context for learning and task design characteristics for ways to encourage participation from all students. The researchers described two conditions that were true for each of the classrooms: (i) the tasks were considered group-worthy, and (ii) the classroom management promoted a high rate of interaction amongst all students. For both high and low status students, there was a strong correlation between the amount of interaction facilitated within the classroom and the amount of student participation. An increase in classroom interaction correlated with an increase in participation. Additionally, the researchers refer to other studies in order to claim that classroom and individual interaction is “a strong predictor of gains in scores on standardized achievement tests, especially for the lower achieving students” (p. 116).

As related to my central research question, results from this study prompt many additional questions about what constitutes a “status treatment” and how teachers can interpret assigning competence and multiple abilities treatments as tapping into students’ funds of knowledge. To learn more about the specific status treatments, I would first want to find studies, either correlational or quasi-experimental studies, which involve larger sample sizes and older students to determine if status treatments improve participation and achievement for different populations of students. Assigning competence and using multiple ability treatments does not seem to deter participation, so I would consider exploring these strategies further and observing students’ participation in my own classroom.

The following study, from Shacher and Sharan (1994), focused on one approach to group work that resulted in greater achievement for minoritized groups of students than more traditional, presentation-recitation instruction. While the researchers do not explicitly measure the relationships between content or topic and students’ participation during group work, I am interested in looking at the ways in which the small group discussions centered on topics that drew on students’ personal experiences.

Shacher and Sharan (1994) conducted a quasi-experiment that aimed to investigate the effects of group work and traditional whole class instruction on two independent variables: (i) students’ academic achievement, and (ii) students’ social and verbal behaviors. The researchers compared results between Western and Middle Eastern students, finding that students from both ethnic groups demonstrated significantly increased academic performance and positive verbal and social behaviors after working in the heterogeneous cooperative learning groups. The researchers used the term “Western” to refer to Jewish students whose families originated in Western countries, which I am inferring would be another way to refer to Ashkenazi Jews. Similarly, the term “Middle Eastern” most likely refers to Mizrahi Jews, whose families descended from local Jewish communities in Middle Eastern countries. I will use the terms that the researchers used in their study: Western and Middle Eastern students. At the time of the study, research regarding differences in verbal behaviors between the two ethnic groups had been widely studied, but this study was the first to investigate the effects of group work on students from different ethnic groups.

For the purposes of their study, Shacher and Sharan (1994) randomly assigned 11 eighth grade history and geography teachers from the same Israeli junior high school to either the Group Investigation (GI) or the Whole Class (WC) teaching method. The Group Investigation method is categorized by the following characteristics and instructional strategies: (i) flexible system of small learning groups, (ii) the learning task requires input and cooperation from each member, synthesis of ideas, and a presentation to the class, (iii) the teacher facilitates and guides learning and oversees organization, and (iv) students choose from available topics of study and work together to accomplish

individual and group goals. The Whole Class method is considered a traditional presentation-recitation approach to teaching. Over the course of the six-month study, trained observers measured how each teaching approach was carried out within the classroom. Near the end of the study, each teacher chose a random, ethnically heterogeneous group of 6 students from their class to participate in a videotaped group discussion. From the video, judges coded the students' interactions and gathered notes about students' verbal behavior and social interactions. The judges were specifically looking at examples of cooperative and non-cooperative interactions addressed from students from each ethnic group to members of their own group, members of the other group, or to the group as a whole. At the end of the six-month history and geography units, all of the students took written post-tests about the academic content.

The researchers used ANCOVA analysis to compare results between Western and Middle Eastern students taught with the Group Investigation and Whole Class methods. Shacher and Sharan's (1994) analysis of students' use of cooperative and competitive statements in the videotaped discussions revealed that Middle Eastern students used fewer competitive statements than Western students overall, and all students in the GI groups made fewer competitive and more cooperative statements to their classmates during a group discussion. Additionally, all students in the GI groups performed significantly higher on the post-test than their WC peers. Middle Eastern students in the GI groups performed at significantly higher levels on the post-assessment than their Whole-Class (WC) peers from both ethnic backgrounds, but not as well as the Western students in the GI groups. This study illustrated the effectiveness of the Group Instructional method in promoting an increase in verbal and social behavior and academic achievement amongst students from Western and Middle Eastern Jewish backgrounds. The students in the study made more cooperative statements after working in groups, and these outcomes encourage the use of group work for developing students' social and academic skill-building within the classroom.

The use of the pre-test post-test control group design strengthened the internal validity of the study because it made it easier to measure any changes in students' academic growth and compare the performance of students from both ethnic groups and in both treatment groups. Western and Middle Eastern students' pre-test scores were similar to those of their ethnic peers in both the GI and WC groups, which indicates that students in each group began the study with similar knowledge of the content. Because there was pre and post-test data, I was more certain that changes in students' academic performance was a result of their instructional grouping. The post-test findings imply that students in the GI classes had more opportunities to discuss and make meaning from the history or geography content within the unit of study, but their participation during class was not measured. The use of trained observers checking on the use of the assigned teaching methods helped to increase the reliability of the results and the researchers could be more confident that the instructional contexts were consistent throughout the study. It is less likely that other unknown confounding variables contributed to students' verbal and social behaviors and academic performance because the researchers ensured that the GI and WC teaching methods were being used with fidelity.

One of the challenges of generalizing the findings from this study to my classroom lies in the complexities of the dynamics between ethnic groups in different countries. The participants in the study were all ethnically Jewish Israelis, and the specific social and historical context from the study cannot be completely generalized to student populations in the United States. For this reason, this study led to me to seek out similar studies that focused on populations of students in the United States.

Furthermore, the findings of the study suggest that Group Investigation strategies have a positive impact on students' verbal and social behaviors during group discussions and may provide students with learning opportunities that result in improved post-test performance. The researchers were interested in looking at the academic and social benefits of group work for students from different ethnic backgrounds, and not necessarily at the content being studied or different approaches to cooperative instruction. However, the topics used during the videotaped group discussions were of particular interest to me because they drew heavily on students' lived experiences. The researchers rationalized that all students would be more likely to respond to a personal prompt that related to, but did not rely exclusively on, their knowledge from history or geography class. It would seem that students from both ethnic groups were more likely to exhibit cooperative behaviors and use various cognitive strategies while discussing a personal prompt after they worked in cooperative groups. These findings lead me to wonder whether developing cooperative behaviors through group work can also help to develop a positive social context where students feel comfortable talking about their lived experiences.

Because this study focused on the outcomes of group work, I am interested in finding studies that compare different approaches to group work in order to better understand what components of the design make group work effective for students and why. Is there a correlation between students' verbal and social behavior during group work and an increase in students' academic performance? Along these lines, I am interested in the group work tasks and topics themselves – do tasks that draw on students' lived experiences result in increased engagement and academic performance?

Calderón, Hertz-Lazarowitz, and Slavin (1998) carried out a study that also looked at differences in achievement between students who engaged with group work with students who were taught with traditional methods. However, a key difference in this next study is that the participants were all ELL students in the United States and the researchers were not comparing findings between ethnic groups. Instead, Calderón et al. conducted a study that revealed that cooperative group work is effective in supporting literacy achievement for transitional bilingual students. In their research, Shacher and Sharan (1995) and Calderón, Hertz-Lazarowitz, and Slavin (1998), touched on the connections between the interactive and verbal nature of group work and academic outcomes. This next study will help me to see ways in which group work can be especially effective for students from linguistically diverse backgrounds and to continue to look for examples of instances where teachers tap into students' funds of knowledge in order to create entry points or connections for new learning.

In their study, Calderón et al. (1998) investigated the ability of a specific cooperative learning program for bilingual students to increase academic achievement for second and third grade students in El Paso, Texas. They used data from two standardized tests to measure achievement. The cooperative learning program was called the Bilingual Cooperative Integrated Reading and Composition (BCIRC), and it was designed to support Spanish speakers in transitioning to English reading.

In the Ysleta Unified School District in El Paso, TX, all Spanish-dominant students received reading instruction in Spanish in kindergarten through second grade. Within bilingual schools, students first build foundational literacy skills in their home languages before transitioning to a second language. While lots of research had been done about the effectiveness of second-language acquisition strategies and models for bilingual schools, little had been done in the way of researching cooperative learning strategies in these contexts. This study was the first to evaluate cooperative

learning in a transitional bilingual program.

Within this quasi-experimental study, the researchers collected quantitative data that included scores on two standardized assessments from three cohorts of students who participated in the BCIRC programs and four cohorts who participated in traditional programs. All of the participating schools were located in the Ysleta Independent School District in El Paso, TX, and they were chosen for the study because they were the lowest-achieving schools with the highest population of Spanish-dominant ELL students. The schools were chosen purposefully, and then randomly assigned to either the BCIRC group or the comparison group. In total, the researchers used data from 222 ELL second and third graders in Spanish bilingual programs in seven public elementary schools.

Teachers who taught using the BCIRC program facilitated reading instruction using direct instruction in reading comprehension, semantic and vocabulary mapping activities, and integrated language arts and writing tasks. Students worked in heterogeneous groups of four during each of the learning activities, and the BCIRC instruction followed a standard sequence: direct instruction, team practice, independent practice, partner pre-assessment, additional independent practice, and testing. Teachers in the comparison schools used traditional textbook reading methods that emphasized students reading out loud and independent workbook practice activities. Both groups used the same curricular materials and deliver instruction in Spanish and English.

The researchers used students' kindergarten English and Spanish proficiency scores from the Bilingual Syntax Measure (BSM) as a baseline for growth and predictor of students' achievement on the standardized tests in 2nd and 3rd grade. The two tests used were the Spanish Texas Assessment of Academic Skills (TAAS) for all 2nd graders, and the English Norm-Referenced Assessment Program for Texas (NAPT) for all 3rd graders. The tests measure Spanish (TAAS) and English (NAPT) reading, writing, and language skills. The researchers compared the performance of students from the experimental and comparison group, as well as between two cohorts of 3<sup>rd</sup> graders who had participated in the experimental program for one or two years.

The researchers found that students who participated in the BCIRC program during 2<sup>nd</sup> grade scored significantly higher on the writing portion of the TAAS than the comparison students, and only marginally higher in reading. The 3<sup>rd</sup> grade students who participated in the BCIRC program for one year scored significantly better than the comparison students on the reading section of the NAPT, but not in language. The 3<sup>rd</sup> grade students who were in the BCIRC program for two years scored significantly higher than the comparison students on the reading and language components of the NAPT, and higher on reading than the 3rd graders who were in the program for only one year. Given this pattern, the findings suggest that the more time students spent in the BCIRC program, the higher their reading scores are likely to be on the NAPT.

When choosing which schools would receive the BCIRC program and which would be the comparison schools, the Ysleta School District and the researchers looked at the BSM pre-test scores to make the groups as evenly matched as possible. Additionally, the experimental and comparison schools had similar demographics and achievement rankings within the district. Describing the similarities between the groups helped to strengthen the internal validity of the results and to decrease the chance of other participant characteristics influencing the results.

The sample size exceeded the minimum recommendation for a quasi-experimental study, according to Mertens (2010, p. 331). Because of the sampling methodology and sample size, I feel more confident generalizing this data to other groups of Spanish-speaking ELL students participating in bilingual programs. However, I am unable to generalize these findings to ELL students in non-

bilingual programs because the bilingual programs offer additional supports and resources in both languages that I would be unable to reproduce entirely in my future classroom. Given this limitation, many of the strategies used in the BCIRC program may still be helpful to consider for working with students who are transitioning from their home language to English. I would also want to look for additional studies that focus on cooperative learning strategies for ELL students in general education classes to see if this mode of learning is still effective for ELL students in linguistically heterogeneous classrooms. Also, I would want to find research that looks at the impact of cooperative learning on groups of ELL students from different linguistic backgrounds, in order to see if there are other learning context considerations or ways that cooperative learning might look different for students' whose home language is significantly less similar to English.

Students in both groups used Spanish and English language in discussions and instruction; so increased student achievement was most likely a result of certain aspects of the BCIRC curriculum and cooperative group model. As described in the study, the BCIRC program entailed a detailed sequence of instruction. In looking for aspects of the BCIRC program to incorporate into a future classroom, it is difficult to determine which specific contexts for learning were the most effective for students, or if the program as a whole should be reproduced in order to achieve similar outcomes. Because the researchers used the students' kindergarten scores on the Bilingual Syntax Measure as the baseline for measuring growth when they later compared their standardized test scores, I feel confident that these measures reflect the changes in students' literacy skills that the researchers intended to measure. However, it is unclear whether or not other factors in students' lives may have impacted their English or Spanish literacy. Because these students likely spoke Spanish at home, changes in their family lives or their parents' literacy levels throughout the year may have impacted students' use of language outside of school.

In looking at the results in relation to my question about strategies for tapping into funds of knowledge, the use of students' home language as a way to first develop academic skills and competencies before transitioning to English is a way to effectively support second-language acquisition and see students' home language as an asset. Because the students who participated in the BCIRC program the longest saw the highest gains in reading and writing scores, it can be inferred that there are connections between the incorporation of both interactive and independent work time and students' literacy development. It makes sense that talking through ideas within small groups, practicing new skills independently, and then pre-assessing with peers would give bilingual students more chances to practice articulating and testing out their new thinking and language, as opposed to simply reading out loud or working alone in a traditional reading classroom.

Many of the strategies from the BCIRC program, such as designing semantic vocabulary maps or story-related writing, seem to offer opportunities for incorporating connections with students' home languages and cultures. The researchers mentioned that the BCIRC strategies involved "rich language experiences that integrated speaking, listening, reading, and writing, and focused on students' cultural backgrounds as much as possible" (Calderón et al., 1998, p. 157). It would seem that the teachers were drawing on students' funds of knowledge by attempting to incorporate students' cultural backgrounds into the curriculum, but explicit examples of these practices were not included in the study.

***Collaborative learning: cultural congruency.*** Many researchers uncovered parallels between students' cultural values and the collaborative nature of group work. Students, whose cultures valued cooperation and worked towards collective goals, were able to engage in, and benefit

from, group work activities that were framed in a collaborative way. Schools have predominantly encouraged individualistic and competitive behavior amongst students, which is more in line with European, middle-class cultural values. The following studies helped me to look for ways to design culturally congruent group work that draw on students' cultural values of collaboration. Because the following analyses explore cultural themes, it is important to consider variability among members of all racial, ethnic, and cultural groups and to avoid ascribing qualities to each member of a given group.

Trueba and Delgado-Gaitan (1985) conducted an ethnographic study that investigated the relationships between Mexican-American students' modes of learning at home and in school. The researchers wanted to know if or how Mexican-American students' cooperative and egalitarian cultural values would be expressed in the more competitive and individualistic school environment. Previous research had pointed to the inability of students to shift between home and school cultures that were significantly different, and the researchers wanted to examine how students were able to adapt to the demands of differing home and school environments. This study revealed that the Mexican-American students integrated their home values into the patterns and values of school and demonstrated both cooperative and competitive behaviors in school.

This article focused on data collected from home visits and classroom observations that were part of a larger, four-year ethnographic study. The classroom observations took place over the course of one academic year, and focused on seven Mexican-American students from four families living in Northern California. The researchers used purposeful, typical-case sampling to identify students who were considered representative of Mexican children aged 6-10. The children were all ELL students from the same elementary school who shared similar cultural and socioeconomic backgrounds and perceptions of schooling. Throughout the academic year, the researchers took notes and recorded students' interactions in the classroom during three-hour visits twice a week.

Home visits with the students revealed that the seven students demonstrated egalitarian modes of interaction both in play and work. Students frequently engaged in tasks and behaviors at home that were cooperative and geared towards common goals. Students' playtime was characterized by a similar emphasis on cooperation, as opposed to individual competition, and suggests that the cultural value of cooperation is carried over during play (Trueba & Delgado-Gaitan, 1985, p. 195).

The researchers observed and recorded interactions between students and teachers in three classrooms, paying specific attention to instances where students voluntarily worked collaboratively. Using their notes and observations, the researchers characterized teachers and classroom environments as those that supported cooperation amongst students and those that promoted more individual, competitive work. The study revealed that students independently negotiated cooperative and competitive interactions and their perceptions of "copying" and "sharing" information shifted between learning contexts. The difference between sharing and copying being that the information was voluntarily given during sharing. Students in all of the classes sought out and provided help to their peers during independent work time, regardless of the teacher's definition of "copying." The researchers suggest that Mexican-American students prefer a cooperative mode of learning and that classroom instruction that reflects these values would best serve these students.

The researchers asked colleagues and other experts to assist in the analysis of the tapes and notes from the observations. These peer checks strengthen the credibility of the study and allow me to trust their findings. Multiple transcripts of discussions between students were provided in the article, though it was unclear at what point during the school year that these conversations took place. It is

possible that students' psychological or emotional development throughout the course of the year could have influenced their tendencies towards cooperative or competitive behavior. Similarly, other variables, such as the use of other modes of learning in other contexts, may have influenced students' behaviors and thereby weakened the credibility of the study. However, this article was part of a larger study where more detailed descriptions and contextual information may be available. Within this study, the descriptions of students' backgrounds and modes of learning in home and school helped me to begin thinking about ways to transfer these findings to my own practice. While these findings cannot be applied to all Mexican-American elementary aged students, it has helped me to consider ways to uncover all students' modes of learning when establishing a classroom environment and designing instruction.

This study reveals powerful implications for classroom practice related to cultural modes of learning. The students in the study not only integrated their knowledge and values from home into the classroom environment, they also sought out opportunities to cooperate despite the teacher's promotion of individual, competitive learning. The researchers point out that "it is possible that if teachers understood the significance of collective work in the Mexican family and community, they could build more effective instructional practices based on cooperative modes of learning" (Trueba & Delgado-Gaitan, 1985, p. 201). I would be interested in exploring additional studies that look at cultural modes of learning. The researchers speculated that partner sharing may have resulted in faster and more efficient acquisition of new skills and concepts for certain students in the studies, and I would want to look for research that looks specifically at the effectiveness of cooperative learning for students who engage in cooperative learning at home.

This study relates to my central question about uncovering opportunities for using students' funds of knowledge within group work by exploring students' cultural modes of learning. By looking at the ways in which students participate in work and play at home, the researchers identified behaviors and preferences that may provide barriers or points of access for students within the school environment. The students in the study were able to shift between the cooperative and competitive modes of learning within school, which will be an important skill for all students whose cultural modes of learning are not typically represented in school. As I develop a responsive practice, I will be interested in attending to participatory structures that are inherently more culturally congruent for students. The following study, conducted by Allen, Boykin, and Hurley (2005), also looked at the nature of cooperative learning as it aligned with students' cultural values.

Allen, Boykin, and Hurley (2005) conducted a study that investigated the effects of communal versus individual learning on achievement of African American students. They found that African American students performed significantly higher on math estimation tasks after working in a communal learning group. At the time of the study, research on communalism had focused on how classroom participation structures affect students' performance on language-based tasks. Therefore, it had been challenging to conclude whether the facilitation strategy of incorporating cultural themes into the learning context or the language arts task type has influenced the results. There was a need to be able to generalize to different types of tasks, and Allen et al. were interested in looking more closely at mathematics tasks in order to better understand the impact of the specific facilitation strategies on student learning.

Allen et al. (2005) carried out an experiment that used a pre-test/post-test control group design where they had two groups of students take a math estimation pre-test, engage in a specific learning context, and take a math estimation post-test. The researchers used disproportionate

stratified sampling and identified 78 African American fifth-grade students, 45 boys and 33 girls, from two different urban public schools in the same northeastern city for their sample. They chose participants whose academic performance fell within the middle 75% for their classrooms and school. Students from each gender were randomly assigned to one of the two learning environments: one with a high degree of communalism and one with a low degree of communalism.

Allen et al. (2005) defined an environment with a high degree of communalism as being “marked by the priority of social bonds, awareness of interconnectedness among people, and a sense of mutual responsibility” (p. 516). According to the researchers, communalism differs from collaboration in that working together is the motivating factor in communalism, while an external motivator exists within collaborative learning tasks. The concept of communalism is identified as having high importance within Afrocultural identity. Each learning environment differed in four ways: (1) structure – groups of three/individual work, (2) the physical context – sitting together with shared materials/individual desks and individual materials, (3) reward structures – no reward/criterion reward, and (4) motivational prompts – communal/individualistic.

The control group was the group with the individual work environment, and the experimental group worked in the communal learning environment. Both groups were assessed using a math estimation pretest and post-test and both groups received either a communal or an individual prompt for the activity and a brief introduction and definition of math estimation. The treatment consisted of a 20- minute study session in which the communal group shared a set of materials and the students in the individual group each had their own materials.

The researchers indicated that the scores on the pre-test were higher than expected among students in both groups and across gender groups. The average score for all of the participants across learning contexts was 42% correct. Following the treatment, students in the high-communal learning condition significantly outperformed those in the low-communal learning context on the post-test. Students from the communal group scored an average of 67% correct, versus 51% correct from the individualistic group.

In considering the generalizability of the findings to other groups of students, the large sample size helps me to begin to see the findings as representative of a larger pattern (Mertens, 2010, p. 330). Because the study specifically attends to the Afrocultural theme of communalism, these results are only generalizable to other African American students. That being said, all of the students were fifth-graders from the same city whose performance all fell within the middle 75% of their classroom and schools. It is possible that factors such as the degree of students’ self-identification with Afrocultural themes, age and developmental level, and geographic region may all have an effect on students’ experience with and preference for communal learning environments. It is important to consider within-group variability and to not ascribe similar cultural values to all African American students.

The researchers made it clear that each of the experimental groups were composed of students with similar pre-test scores, even numbers of boys and girls, and students with similar socioeconomic backgrounds. These shared characteristics within the groups helped to reduce the threat of differential selection and strengthened the internal validity of the study. The researchers also pointed out that the content being studied, mental math, was rarely tested in school but is considered a fundamental skill in mathematics. This reduced the opportunity for outside influence, or history to influence students’ performance. I can be more confident that the students’ achievement was a result of the communal learning conditions. The experimenters followed clear trainings about how to

interact with students during the instruction, and they were given a list of statements to guide their interactions with each group. The use of trained observers increases the reliability of the results and reduces the impact that the experimenter can have on the internal validity of a study.

The learning environments were defined by multiple characteristics, such as the use of conditional motivational prompts, reward structures, physical configuration, or learning structure. Because there were multiple dependent variables within the treatment itself, it is possible that any one of those factors may have influenced the students' post-test results, or that the improved scores were only a result of the combination of factors. Further research would be needed to isolate specific aspects of the environment that were effective for students' learning.

This study helped me to expand my understanding of the ways in which group work can be designed to align with students' cultural values. The communal context for learning was what allowed students in this study to access the math estimation content, and this mode of learning is the fund of knowledge that students may bring with them to school. This research suggests that, regardless of the content, cultural congruency of the instruction itself can be beneficial for students.

**Summary and implications.** Research suggests that the learning context and participation structures within the classroom impact students' access to learning materials, rate and quality of participation, and academic achievement. Group work has been shown to improve academic achievement for culturally and linguistically diverse students (Shacher & Sharan, 1994; Calderón et al., 1998, and Allen et al., 2005). The studies analyzed in this review look closely at different aspects of collaborative learning and suggest or imply reasons for its effectiveness. The first three studies focused on the social, verbal, and academic implications of group work (Cohen & Lotan, 1995; Shacher & Sharan, 1994; Calderón et al., 1998), while other studies focused on ways that students' cultural values were reflected within group work (Trueba & Delgado-Gaitan, 1985; Allen et al., 2005). Looking at ways to design cooperative learning tasks to increase student participation and also looking at ways to make group work compatible with students' cultural modes of learning are both important for understanding why collaborative learning can improve achievement for students. Additionally, this analysis has helped me to identify areas where I can incorporate students' funds of knowledge into the learning context in order to develop more responsive and effective instruction.

Several of the studies within this review investigated the participatory nature of group work and measured students' verbal and social behavior. While these studies did not explicitly measure a range of culturally specific verbal and social behaviors, the findings linked certain examples of cooperative and participatory behaviors with academic achievement. These researchers saw group work as possibly beneficial for students because it provided them with opportunities to discuss new thinking, develop and practice using academic language and/or English, and engage more with the content than traditional instruction (Cohen & Lotan, 1995; Shacher & Sharan, 1994; Calderón et al., 1998). In thinking about students' verbal and social behaviors, as well as specific aptitudes and skill sets, as some of their funds of knowledge, I can begin to think about collaborative learning as an opportunity for supporting students' access to content.

While each of these studies outlined a specific group work framework or approach, they did not compare the effectiveness of different frameworks; rather, they were looking at group work versus traditional, independent work. Specific sample populations within the studies, such as Middle Eastern Jewish junior high students or Spanish ELL students, make it difficult to generalize the group work designs to other student populations. However, it is helpful to look for similarities between the treatments and findings outlined in the studies. Two of the studies emphasized the importance of

using learning tasks that were considered group-worthy, requiring input and cooperation from each member of the group (Cohen & Lotan, 1995; Shacher & Sharan, 1985). It would be helpful to find studies that examined the differences between collaborative learning frameworks, particularly those that drew explicitly on students' funds of knowledge. In my own classroom, I intend to use what I learn about students' individual funds of knowledge to design group-worthy tasks that depend on relevant skills and abilities from each student. By giving each student a meaningful entry point into a collaborative learning task, I hope to increase their engagement and participation.

Additional studies within this review focused on the nature of group work as it relates to students' preferences for collaborative or communal contexts for learning. Research suggests that collaborative group work can help to shift the culture of schooling away from the dominant norms of individualism and competition in a way that supports learning for culturally and linguistically diverse students. For example, the research implied that there is a strong difference in context preference between Anglo students and African American and Latino students. While Anglo students prefer and succeed in competitive, individualistic learning environments, African American and Latino students prefer and may achieve at higher levels when involved with collaborative learning groups (Trueba & Delgado-Gaitan, 1985; Allen et al., 2005). In this way, the modes of learning themselves can provide students with entry points for engaging with the content. It will be important to learn more about students' individual learning needs within my practice, but it is helpful to consider their home socialization practices when planning instruction. To begin to build this consideration into my practice, I can ask families and students about ways that they solve problems and learn new things outside of school. By sending home surveys, meeting with parents, possibly visiting homes, or otherwise opening up this communication with families early on in the school year, I can think about ways to incorporate students' modes of learning into the classroom.

Because these studies focused on cultural values specific to African American and Mexican-American students, it is difficult to transfer or generalize the findings to every individual within the target populations. However, the ethnographic study made explicit connections between the seven Mexican-American participants' cooperative home and school behaviors and the experimental study referred to a body of research that supported the validity and significance of the Afrocultural theme of communalism (Trueba & Delgado-Gaitan, 1985; Allen et al., 2005). The important similarity between the two groups within the studies was that the students benefited from working together and sharing materials. These results help to me consider ways to transform the classroom culture in a way that allows for and encourages more flexible peer or small group work. Opportunities for students to voluntarily seek out or provide peer assistance are just as important as intentional group work activities.

There are many ways that collaborative learning can be used effectively for different groups of students, and there are similarities between these approaches. While there is no collaborative learning framework that will work best for all groups of students, there is evidence to support a correlation between an increase in students' social interactions and cooperative behaviors and increased access to learning and achievement. Knowing individual students and their home socialization and preferred modes of learning will be essential for planning effective group work. Group work that engages students' verbal and social behaviors can also build in their cultural ways of knowing, speaking, and problem solving relevant to the content. Group work can also be in and of itself a bridge between students' home and school cultures. Both of these ways of thinking about group work view the instructional strategy as an access point for students.

## **Arts Integration**

*by Daniel Moskin*

The following section of analysis seeks to answer the question, *How do students building authentic connections between their worlds and the classroom benefit from or depend on arts integration as access points to deeper learning?* The use of artwork to support or guide learning presents new possibilities for students to access and interact with curriculum in different ways (Lopez, 2012). As we learn more about the possible benefits of a Funds of Knowledge driven classroom, I aim to better understand potential connections between how students best relate to content, build knowledge, and communicate understandings with the aid of art interpretation and creation.

In searching for related research (primarily on the ERIC and EBSCOhost databases), I used the terms “funds of knowledge,” “culturally responsive teaching,” “culturally reflective teaching,” “culturally responsive pedagogy,” and “culturally reflective pedagogy” in combination with terms such as “art” and “arts integration.” These searches resulted almost entirely in qualitative studies. I found it challenging to locate peer-reviewed studies relating to both FoK and the arts. For this reason, two of my five studies do not make explicit connections between art and Funds of Knowledge. However, I still found relevance in identifying themes in culturally responsive teaching strategies that could be adapted in a visual arts class or other content area with visual arts integration.

Due to the qualitative nature of the majority of the studies in this section, I attempt to make connections between the descriptions of outcomes in isolated classroom experiences and broader applications across content areas. Two themes are recurring in these studies. First, the potential of culturally responsive pedagogy to increase student engagement, relevancy, and ultimately learning. Second, the acknowledgment that implementing Funds of Knowledge strategies is a complex and nuanced approach to teaching. The FoK approach requires a substantial and sustaining commitment from educators to attend not only to creating connections between students’ lives and the classroom, but to also continuously alter the structure and supports within the learning environment to best meet the needs of students.

Despite the apparent challenges of implementing such nuanced curriculum, the need for openness to teaching strategies that best serve diverse student populations drives my exploration. By better understanding how I can plan for, adjust, and facilitate teaching strategies for my students that will have the maximum potential for meaningful student learning, I can approach each unique student population with their best interests in mind. Creating opportunities for students to be successful in an academic setting while building knowledge and skills that will help them become valuable contributors to their communities has encouraged me to explore Funds of Knowledge, culturally relevant pedagogy, and arts integration: three wonders that will continue to guide the refinement of my practice.

**Review of literature.** The exploration of the benefits to student learning in cross-curricular education allows us to consider the role of art in public schools. With this in mind, Lorimer (2011) attempted to identify how integrating art concepts across all content areas could help address developmental needs of diverse groups of students. Observations and interviews were conducted to determine how incorporating an arts integrated pedagogy within middle level schools could help close the opportunity gap between wealthy schools with art programs and low-performing and

economically disadvantaged students that were less likely to receive quality arts education experiences.

Data was collected in this qualitative case study through observations and interviews. Observations occurred three times at each of five middle level classroom sites in southern California and focused on the learning environment, student-student and student-teacher interactions, types of activities, levels of engagement, types of arts integration, and classroom discourse. The researchers recorded, transcribed, and then synthesized follow-up interviews with the teachers of these classes in order to identify recurring themes and relationships.

The five classrooms that were observed were selected because they operated within schools that emphasized visual and performing arts in the curriculum and served high populations of ELL students, students from economically disadvantaged families, and students from a wide variety of racial and ethnic backgrounds.

The findings showed that teachers using art integration as a tool to develop culturally relevant lessons could foster active engagement and personal connections between students and the curriculum. In units that were built to use artwork as an entry point to draw upon prior knowledge and experience, students showed high levels of participation and deeper thinking. The researchers noted examples such as the use of popular music and simple dance steps to help explain fractions, drawing representations of the hypotheses and results of science lab experiments, and using observation skills to analyze artwork for clues to support history lessons. In all three of these examples, students were connecting their prior knowledge to the art being used to help them gain deeper understanding of each particular content area.

Arts integration lead to the exploration and increased understanding of students' own lives and experiences by offering gateways to learning through inferences, discussion, and experimentation. Complex concepts in social studies and science classes were made more accessible as students used their prior knowledge as reference points to help relate to artwork as they deepened their understandings of the given learning target. Researchers observed the attainment of complex academic language use in collaborative, student-centered work environments when artwork was used as a visual aid and/or prompt for discussion.

The combination of extensive observations, interviews, and subsequent analysis supported the generalizability of these findings. Member checks were used to increase the credibility of the study, as researchers related their observations and data collection back to the teachers being interviewed. The teachers then adjusted their practices based on feedback.

While the data presented is supported with thick description, no interviews were conducted with students. Student member checks would enhance the credibility of this study by confirming that there was a connection between their improvements in attendance, engagement, and deeper learning as a result of their in-class activities.

The implementation of culturally responsive pedagogy and arts integration as shown in this study resulted in positive outcomes for a wide variety of students, including those that were traditionally less engaged in a content related meaning making process. The practical examples described in the study suggest the potential for arts integration as a way to create relevance in the curriculum for a diverse student population. Experimentation of conceptually similar applications in other classrooms would be defensible based on the positive outcomes among a wide variety of students using artwork to help bridge their lived experiences to the classroom, however, the relatively small sample size suggests that outcomes could be determined in part by the student populations

themselves.

As schools in North America become increasingly diverse, more questions are being asked about the need for culturally relevant pedagogy that connects students' lives and proficiencies with classroom activities. With the implementation of such nuanced teaching strategies, greater support is needed for teachers that are willing to take on the complex task of infusing richer and more relevant learning experiences for their students.

Lopez (2012) sought to identify effective elements of culturally relevant pedagogy within a 12th grade English language arts class practicing performance poetry. Her goal in conducting this qualitative case study was to better understand the complexities of culturally relevant teaching while identifying a few practical steps teachers can take to invite diverse groups of students to think critically and achieve greater academic success. Lopez focused on her observations of exploratory techniques used by an English teacher and attempted to draw conclusions from the results of in-class activities.

The participants in this study were from a secondary school in Ontario, Canada. At the time of the study, the school had over 1,600 students and was situated in a diverse suburban community with over 500,000 residents. While the school had a reputation for many of its graduates attending college, the student body was largely comprised of traditionally marginalized ethnic, racial, and cultural populations of students and families.

The school where the study took place implemented tracking that placed students on one of three paths - university, college, or the workforce. This study was done with a teacher of African-Canadian descent who taught within the university and college tracks. Her regular journaling and dialogue with the researcher to discuss and analyze in-class experiences were thoroughly documented.

A scaffolded approach to incorporating performance poetry was necessary for student engagement. First, the teacher established guidelines for creating a safe space in the classroom. Next, students engaged in a variety of increasingly complex exercises as they became more comfortable with the process, and more importantly the highly personal content, of performance poetry.

In addition to creating poems that had personal relevance to each student, students engaged in a wide variety of traditional language arts procedures from editing, rewriting, and orally presenting. They were evaluated on their use of poetic literary devices such as imagery, voice, structure, and organization. Students across the board showed increases in their summative grades after being presented with alternative and culturally relevant methods of demonstrating content knowledge.

The participant teacher, as well as many students, agreed that their poetry unit was a powerful learning experience in which they were able to share their perspectives and learn about the lives of others while honing their English language proficiencies. It was noted, however, that the time spent in scaffolding this unit is time that many teachers feel that they don't have. The extra planning and effort on the part of the teacher were in part possible because of the extra support and guidance that the researcher provided.

While focused on the experiences of a single teacher, this study included multiple examples of student work within the context of a culturally relevant unit. These examples reflect the safe space that the teacher helped facilitate by openly exploring sensitive material. There was an emphasis on making sense of student feedback and developing understandings that went beyond anecdotal referencing to help illuminate the authentic outcomes of culturally relevant learning experiences. This data serves to support the observations led by the researcher and reflections of the participant teacher

to accurately represent some of the strengths and shortcomings of implementing culturally relevant pedagogy.

While the data presented feels authentic and relatable, the singular example of performance poetry also presents a narrow experience, however practical, for other educators to replicate. This study would be more transferable if the same concepts of culturally relevant teaching, including the creation of a safe learning environment and culturally congruent forms of expression, were applied to different student populations, projects and/or within different content areas. However, Lopez (2012) described noteworthy successes and these strategies for student engagement warrant further exploration and adaptation in diverse middle level classrooms.

As educators and researchers seek to establish connections between culturally relevant teaching and student achievement, new ways of structuring curriculum that offer multiple entry points are becoming increasingly important. According to Schubert & Melnick (1997), incorporating the arts in primary, middle, and secondary level, in any content area, can lead to students not only having increased opportunities to make connections between their lived experiences and school, but to increased understandings of connections between content areas, resulting in deeper understandings of academic concepts.

Because art learning has typically occurred in a specialized classroom taught by a specialized art teacher, few connections have typically been made between the content of these art classes and the curriculum of other content areas. Teachers are beginning to see the positive effects of arts integration from the incorporation of multiple intelligence, accommodations for a variety of student abilities, and in creating personal relevancy between students and content. This qualitative study attempted to identify the ways in which arts integration can create multiple entry points for students across content areas to learn and express their knowledge.

Their qualitative study involved eleven school districts from Pennsylvania. All participating schools were part of a federally funded program to develop an integrated, multidisciplinary curriculum framework model. These eleven schools were situated in rural, suburban, and urban settings, comprised of elementary, middle, and high school levels. Each school was linked with a partner at a university to assist them in developing lesson content. The lesson content was focused on arts integration with history, civics, English, and geography. The type of arts integration ranged from dance, visual arts, music, and theater. The units studied ranged from weeks to a full school year.

In-depth interviews were conducted with seventy teachers and administrators and twenty-five students over a one-year period to better understand the effects of arts integration on learning across content areas.. All interviews were recorded and transcribed for further analysis.

Teachers and administrators frequently reported that students exhibited a greater self-concept and a more positive attitude towards school. These findings were confirmed by multiple schools describing student performance showing significant gains when regular curriculum was combined with the arts.

Multiple cases resulted in both students and teachers describing students with previous reputations as underachieving, exhibiting challenging behavior, and being uninterested in school, becoming leaders in their classes, using art as a way to express their ideas and understandings in ways unseen before in more traditional learning environments. This shift in status often resulted in the struggling student demonstrating greater learning and achievement in content areas that were historically problematic for them.

Students frequently described their new arts-integrated homework as not being boring and had

an easier time understanding why each concept or lesson was being explored. In classes with ESL students and students that needed extra support, teachers identified that a more equitable learning atmosphere had been achieved through arts-integration, and that many of the students that needed additional supports actually outperformed the other students in their classes in arts-based activities.

Additional reports from students claimed that in using art to show understanding in a subject, that they were better equipped for evaluations because they retained the information throughout the whole school year, and in many cases students continued the study of a subject matter long after the lesson was completed.

The study acknowledges that they have not identified the effects of long-term arts-integration, but findings suggest that students respond in positive and surprising ways. Students that were presented with the same information in multiple ways engaged in authentic learning experiences and frequently retained what they learned.

Because the study was conducted in eleven schools across all grade levels in rural, urban, and suburban communities, there was a wide variety of data collected from schools that may share commonalities with other learning environments. The vast pool of participants and the length of the study also increases transferability. Evidence reported from multiple community contexts helps solidify the findings as being applicable to students that share different lived experiences in different settings.

Triangulation was employed as many teachers, students, and administrators were interviewed for this study. It was helpful for administrators and teachers to identify positive behaviors in students as they experience art-integrated classes, but the confirmation from students in their own words provided much more solid evidence that the intent of art-integration was serving its purpose.

While data from multiple sources helped to paint a more complete picture of the findings, no alternatives to this model of arts-integration were discussed or proposed. No examples of art-integration failing to meet expectations were shown. No data or quotes from students, administrators, or teachers for whom arts integration was not useful are used for comparative purposes.

Many quotes and examples are used to illustrate the positive effects of arts-integration, however, there did not seem to be any system in place to code or track the responses from interviews, compromising the confirmability of the data. In addition, because the entire study was based on interviews, researchers based their results entirely on the retelling of experiences from the participants, and were not present for the classes where the experiences occurred. As readers, we do not know how much time elapsed between the arts-integrated units in question and the interviews, which could cause for an inaccurate representation of the experiences.

As the future of visual arts programs and classes continue to be in jeopardy, integrating the arts across content areas not only allows for students to be exposed to and experiment with a variety of art forms, but provides them with entry points to learning complex material that may have been previously blocked with obstacles.

Because this study used such a broad range of student ages and communities, the results are encouraging. Through countless examples in this study, arts-integration not only encouraged students to draw from their own skills and lived experiences, but showed strong links to increased understanding, performance, and retention.

I see a clear correlation between arts-integration and Funds of Knowledge, as teachers are able to tap in to student smartnesses and help them engage with content in ways that reflect different learning styles and cultural norms. The benefits of tying the cultural capital of students into the

classroom in authentic and meaningful ways through art not only improved student engagement but positively affected retention, an important consideration within school systems that often rely on summative assessments to measure growth.

While the qualitative studies in this section have suggested a link between culturally relevant teaching and academic success among diverse students, very little research has been done to quantitatively measure the relationship between teachers using culturally relevant pedagogical techniques and student success. Love & Kruger (2005) attempted to quantify which particular traits of culturally relevant teaching could be attributed to high student achievement rates.

The researchers used correlational study methods to compare the pedagogical beliefs of fifty school teachers with their students' aggregated achievement data, pulled from test scores in math, reading, and language arts. These fifty teachers were selected from a prior study amongst six schools serving predominantly African American students in urban areas that were selected by convenience. In four of the schools, 95% of the students received free and/or reduced price lunches. The initial study included 244 teachers, paraprofessionals, counselors, principals, and specialists. Data from these sources was collapsed across school and grade levels.

A survey with 48 statements was distributed to the participants to measure their beliefs and understandings of culturally relevant teaching by using statements that related to the ways that knowledge is shared within a classroom and the roles that teachers and students assume to maximize learning. Each statement was rated by the participant on a scale of 0-5 ranging from strongly disagreeing to strongly agreeing with any given philosophy.

The fifty lead classroom teachers in this correlational study were selected based on evidence of their reliability and higher rankings in categories like involvement in staff development and higher standardized test score results. Data from these teachers' original survey results were compared with the scoring of their students' standardized tests.

The researchers found that there was a significant positive correlation between teachers of higher achieving classes (as evidenced by standardized testing) and the belief that a teacher's primary job is to disseminate knowledge. There was also a significant positive correlation between teachers of higher achieving classes and the use of repetition, drill, and practice.

Despite these findings, there was a significant correlation that suggested that teachers felt it is just as important for them to learn from their students as it is for their students to learn from them. They also reported that most of the fifty teachers largely felt that every student they encounter is successful at something. The researchers note that their "results do not necessarily provide enough evidence to conclude that teachers do not build on prior knowledge as they teach new concepts." (Love & Kruger, 2005, p. 9)

All participants responded to identical survey material, however, the selection of participants was based on convenience for the first study, and on quantitative measures of teacher success in the second. Without choosing teachers based on the observations or reports of their culturally relevant teaching, this method of selection felt arbitrary. There is no qualitative data that suggested that any of the teachers claiming to exhibit culturally relevant teaching practices actually exhibited these behaviors.

Teacher responses were compared to student test results, but no other data was compared to support the connections that the researchers made between the two pools of data. This data is built on the beliefs of teachers, but there is no evidence that would show if and how their beliefs informed their teaching practices.

The data indicates a strong link between teacher beliefs and student achievement, but the methods in which the study was conducted leave too many questions unanswered about the measurement of student success and its relationship to teacher beliefs and practices, especially as it relates to culturally relevant teaching. Further examination of the connection between teacher beliefs and students outcomes would need to coincide with deeper observation of the teachers and students in an authentic classroom setting. For these reasons, I believe it will be important to examine my own beliefs of culturally responsive teaching, but feel that tracking the results of my practices related to these beliefs will better inform my teaching than the beliefs alone.

After examining connections between teaching practices and positive outcomes in the four previous studies, I still had lingering questions about the challenges that implementing FoK and CRP would provide. Studies have shown that culturally relevant practices in the classroom can lead to more meaningful learning for historically marginalized racial groups in the United States (Highland, 2009). At the same time, the work force of public school teachers are comprised predominantly of white female teachers who often transfer to schools with a larger white population or leave the teaching profession all together after a few years. Highland (2009) attempted to document the process of a white teacher, new to the profession, as she committed to teaching students of color while working to develop culturally relevant pedagogy through asking the question, *what are the practical, ideological, and discursive barriers that teachers face while attempting to enact culturally relevant pedagogy?*

Collected over two years, this study was a hybrid of action research, discourse analysis, and critical interpretive analysis of qualitative data. The researcher observed twenty different one-hour sessions in fourth and fifth grade classrooms with predominantly African-American students chosen by the teacher participant. In addition, three formal two-hour recorded interviews with the teacher were conducted and transcribed. Countless notated conversations with the teacher and the teacher's own journal responses were also used to inform the study.

Highland found that engaging students in culturally relevant pedagogy not only set the stage for the teacher to have high expectations of each student's contributions to the class, but issues like classroom management that were commonly problematic for new teachers became second nature as students were exhibiting responsible group and individual work behaviors because of a genuine interest in engaging with the work.

Over the course of two years, African-American students began to look for examples of cultural and racial connections to the curriculum, asking to learn more about the subject matter through a lens that was more reflective of their own experiences. A space in the classroom was identified for students to post questions that they had related to content, which were eventually filled with wonders about race and gender that allowed the teacher to directly address relevant issues to students through community meaning making. Practices like this helped to create a classroom culture of critical thinking through inquiry, and students began to feel more valued as their own questions and experiences became essential to the process of concept attainment.

Projects that connected the classroom to the community were established, but the teacher admittedly did not take advantage of them to connect with members of the community outside of her classroom. She also struggled with making connections to the parents of her African-American students. The teacher acknowledged that she had shortcomings in this area, but struggled to see how a teacher could juggle additional responsibilities outside of school in addition to her personal responsibilities.

Member checks were used as the researcher worked closely with the teacher participant of this study to insure that representations of her experiences were accurate. The researcher adopted the role of critical friend to the teacher as they discussed the researcher's interpretations and analysis in a transparent way.

An element of negative case analysis was apparent. Highland was transparent about the ways in which culturally relevant teaching was challenging and problematic for the teacher participant. This honest look at the strengths and challenges of culturally relevant teaching painted an authentic picture of the reality of a new teacher attempting to support and serve historically marginalized racial groups when their time and resources were in short supply.

While the focus of the study was culturally relevant teaching with extensive supporting observation, discussion, and description, there was only a single teacher participant. The lack of multiple cases weakens transferability due to the limited scope of experiences that are represented.

Questions about the attention to the voice of the students also arose for me. This study specifically attempted to identify the positive outcomes and challenges of teaching culturally relevant pedagogy to marginalized students, yet no interviews were conducted with the students or their families and communities. The results of the study are based entirely on the perspective of the researcher and teacher participant. In a study based on bringing relevant classroom experiences to students, who better to ask about the effectiveness than the students themselves?

As an emerging teacher, this study is relevant because of its documentation of a new teacher's successes and challenges as they implemented culturally relevant teaching. However, the bulk of the data coming from a single teacher limits my ability to make connections to a similar setting, as my students and my own teaching style will differ from those in this study. There are techniques used in the study such as the board for posting student questions that feel applicable and would be worth experimenting with, but to make any conclusions about the overall effectiveness and implementation of culturally relevant pedagogy, I would like to seek additional research with a wider spectrum of cases to support these concepts.

**Summary and implications.** Common themes throughout the studies in this section suggested a relationship between accessing students' funds of knowledge in a culturally responsive classroom and increased student engagement, learning, and understanding of one another. From the personal and transformative nature of performance poetry (Lopez, 2012) to the illumination of complex scientific concepts (Lorimer, 2011) it is increasingly evident that providing students with a wider array of opportunities to construct and share knowledge will help develop their critical thinking skills while opening doors for more relevant methods of meaning making. The first three studies make explicit connections between arts integration and increased access points for student learning, which remains at the forefront of my curiosities moving forward.

While the settings and specific strategies of these studies may not be entirely reflective of my own future classrooms, the possible positive outcomes of a student-centered curriculum that supports individual experiences, perspectives, and cultural norms is encouraging. I look forward to engaging in action research within my own classrooms, exploring the many ways that I can use the combined experiences and learning styles of each student to inform my choices as a classroom facilitator.

I will continue to seek additional studies that analyze Funds of Knowledge and culturally relevant teaching strategies, especially those that more specifically highlight students' own perceptions of how these techniques affect their learning and positionality as a member of a learning community. The insights of teachers and administrators provided many strategies to consider, from

using artwork to stimulate and guide discussion to student created work that presented new ways to interact with complex material. However, the lack of in-depth interviews and member checks with students throughout the studies that I found left many questions for me about the ways in which students can identify and articulate the benefits and challenges of participating within these frameworks. Establishing a link between the personal and unique nature of students' funds of knowledge and the facilitation of culturally relevant teaching demands that the very students who are being taught have a voice in their education. I plan to listen to the voices of my students so that my attempts to offer multiple access points to academic content will be reflective of their prior knowledge, passions, and needs.

### **Service Learning**

*by Eliza Alexander*

Funds of knowledge refers to the skills, abilities, practices, ideas, experiences, and domains of knowledge that a student acquires and can access throughout their lives outside of school (Gonzalez, et al., 2005). As a pedagogical approach, Funds of Knowledge (FoK) draws on these resources to support student learning; the previous sections of this paper explored FoK strategies in the areas of collaborative work, academic discourse, arts education, and family communications and explored ways to access and integrate students' funds of knowledge in the classroom, and how to bridge the gap between school and home. This final section investigates how teachers can use service learning as an instructional tool for facilitating students' exploration of their own communities, in order to access the funds of knowledge that are present.

The search terms that shaped this study included: effects of service-learning on (student academic achievement, student development, nonacademic outcomes); funds of knowledge, culturally responsive pedagogy. The key terms that surfaced throughout the research include: funds of knowledge, which refers to a students' personal, cultural, and community assets. Service-learning is an instructional method that engages students in problem-solving within the context of a community problem. This section consists of five studies, including quantitative research (quasi-experimental), and qualitative research (single and collective case studies). The studies explore urban and rural settings. They consider data from students, but the reflective input comes primarily from teachers and community members.

This section begins by providing justification for these instructional methods by describing the effects of service learning on students' academic achievement. It then investigates how teachers have effectively implemented service learning in ways that help students connect with the funds of knowledge in their community, and it concludes by discussing the recurring themes from the research as well as implications for my future practice.

**Rationale.** Service learning is “a method of encouraging student learning and development through active participation in thoughtfully organized service that is conducted in, and meets the needs of, a community” (EPA, 2011). As a preservice elementary teacher, I was interested in learning how teachers can facilitate service learning in a way that helps students access the funds of knowledge in their communities. A major part of students' funds of knowledge stem from their community, found in the knowledge, experience, resources, and networks that exist there. These funds of knowledge exist whether or not students know about them or know how to effectively navigate them; I am interested in supporting students' development (both academic and non-

academic) by helping them connect with their community's funds of knowledge.

A sub-question that guided my research was how service learning supports or impedes students' achievement on standardized tests. I learned through my initial research that one of the controversies around service learning is its potential to distract from standardized test preparation. I recognize that my students' academic success (and thus the efficacy of my teaching) will be measured with standardized tests, so any instructional tool that I utilize should effectively facilitate their achievement. While students' academic achievement is my primary goal as a teacher, I also hope to support their non-academic growth, including their development of skills that will help them become competent citizens. Prior to my research, I had a preconception that service learning could support students' non-academic growth by engaging them in collaborative problem solving; in this paper I also explore the non-academic benefits that service learning may create opportunities for, including how teachers can use service learning to facilitate that growth.

**Review of literature.** Whether or not service learning supports students' achievement on standardized tests is central to this research, without supporting benchmark achievement, service learning not a viable instructional approach. The first study in this review responds to this concern. Soslau, E. and Yost, D. (2007) sought to answer the following questions regarding both academic and nonacademic achievement/outcomes: Will students exposed to service-learning be able to make the connection between standard educational curricula in the existing disciplines of the core curriculum subjects (math, literacy, social studies, and science) and real-life connections? Does service-learning impact students' achievement as measured by district-wide, benchmark assessments? Will students exposed to service-learning experience an increase in motivation and desire to learn? The sample for this study included two 5<sup>th</sup>-grade classes, one of which was one of the author's classes. The students from both classes were primarily African-American and eligible for free lunch. Both classes had 33 students with equal male-to-female ratios and similar ethnic and racial backgrounds, though the researchers do not provide specific demographic information.

This study utilizes a mixed methods design to compare the effects of service learning with the effects of instruction without service learning. The same pair of teachers (literacy/social studies and mathematics/science) was responsible for each class, and the students were not aware of the research. They facilitated students' selection of a project topic and focus, and then integrated the projects with the existing curriculum provided by the district. Several service-learning partners and guest speakers visited the classroom to serve as living resources for students, who prepared questions and discussion topics for each visitor. They used their developing understanding of different issues to take some kind of action, such as writing letters to store owners to increase wheelchair accessibility. The traditional framework did not include this service learning component. The researchers collected data and included journal responses, benchmark test scores, attendance records, and suspension incidents-- these indicators of measurement were chosen for the purpose of providing a holistic, quantitative and qualitative view of the students' progress; the researchers also sought data that explored the link between service learning and student achievement, motivation, and learning. The researchers felt that attendance and suspension records could indicate level for student motivation. They qualitatively analyzed students' four monthly journal responses using open-coding procedures that identified emergent themes and number of real world connections that students made. The researchers measured academic achievement using criterion-referenced, benchmark assessments, which they obtained from a district-managed web-based database. They measured attendance and suspension using records from a school-wide database system.

The researchers analyzed students' monthly journal responses for real world connections and emergent themes, and found that the experimental group was 15% more likely to make real-world connections than the control group, based on averages for both groups. A baseline comparison of both group's benchmark test scores showed that the experimental group made greater academic gains over the course of the year than did the control group. The experimental group increased their math scores by 16%, as compared to 10% in the control group; the experimental group increased their reading scores by 6%, as compared to 2% for the control group. When the researchers analyzed attendance records, they found that students in the experimental group were slightly more likely to attend class (94.04% attendance rate as compared to 92.25%). Suspension reports showed that there were less incidents of suspension (28 in the control group, 13 in the experimental group), number of students who received suspension (12 students with 6 repeat offenders in the control group, 6 students with 4 repeat offenders in the experimental group).

The consistency of having the same teachers responsible for each class strengthened this study's internal validity, by reducing variation from different teaching styles. The treatment came from an established service learning curriculum, which makes it possible for me (or another researcher) to implement nearly the same treatment; I am curious as to whether the results would be the same for a different sample. The researchers used open-coding analysis, which helped ensure that the findings emerged from the research, and not from the researcher's initial perceptions; I would like to see more detail about their coding process in order to have a clearer understanding of how they went about this.

This study found that service learning is a viable instructional strategy that can support students' academic achievement on benchmark tests, which is essential to my research -- if service learning does not facilitate academic achievement, it's other benefits don't matter for me as an Elementary teacher; this is why I chose to lead my section with this study. However, now that there is some evidence of the potential of service learning to support academic achievement, I shift the focus of this section toward examining how service learning can be used to help students connect with their community's funds of knowledge.

In a qualitative case study, Buck and Sylvester (2005) described their efforts to facilitate pre-service teachers' investigation into the funds of knowledge within the community where they will be teaching. The pre-service teachers were enrolled in two integrated courses (Social Studies Methods, School and Society) at the University of Pennsylvania Master's Program in Elementary Education. Their research into the community involved taking inventory of the five-block area around the school where they would be teaching, followed by interviews and observations. Then, they triangulated the data with demographic and primary historical sources. Finally, they designed a social studies curriculum integrating the funds of knowledge they discovered. They conducted their investigations over the summer before they entered the schools.

Buck and Sylvester found that the pre-service teacher's exploration of the communities was a positive experience that shed light on the participants own sense of self in relation to the community, which seems important for teachers who want to use a FoK approach -- if they are not aware of their own connection to the community in which they teach, how can they facilitate students' connections? The authors also discussed the importance of adopting a strengths-based outlook; instead of viewing a community for its deficits, first consider the strengths. This is important for thinking about service learning, because if teachers are only highlighting the challenges within a community, they send a message to their students about that community; however, if teachers are prepared to highlight the

strengths and resources -- the funds of knowledge -- within the students' community, the students will begin to see those strengths as well (if they haven't already).

While this study focuses primarily on a tactic for unearthing community funds of knowledge, it is relevant to my research on service learning as a FoK strategy because if teachers are aware of the community's funds of knowledge, they will be able to integrate that into the service learning projects, helping students to recognize the available resources while also facilitating their problem-solving skills. One of the pre-service teachers in this study wrote in her report, "...The classroom has the ability to serve as a breeding ground to help students develop into informed citizens who realize their potential to initiate and carry out change" (Buck and Sylvester, 2005, p.228). This speaks to the nature of using service learning as a way to connect with the funds of knowledge in students' communities -- the service learning is a context in which students complete a problem solving process using the resources available in their communities. In addition, this study speaks to the value of community partnerships -- the pre-service teachers had the assistance of a community liaison accompany them and guide them into the community. From that connection, the pre-service teachers were able to hook into a community network to learn about-- and then plan a unit around-- the community's funds of knowledge.

This case study provided thick description about the sample, which were entirely urban communities. The findings could certainly transfer to other urban settings, and I wonder if they could transfer to non-urban settings as well. At the same time, all of the sample members were guided by one of the authors; it is hard to know if their experiences would have been the same had they not had this explicit support. One of the benefits of this, however, is that the author pushed against the pre-service teachers' developing ideas in order to help them adopt a strengths-based outlook. This seems almost like a debriefing process, except the details of this process were not fully outlined. I am curious how the pre-service teachers checked their developing ideas with one another, and how the author checked *their* thinking -- knowing more about the debriefing process would help me feel more confident that the findings did not arise from bias.

The previous study explored how teachers can learn about a community's funds of knowledge, which could become a basis for effective service learning. In the next study, pre-service teachers plan and implement service learning projects in the community where they will be teaching, prior to the start of the school year. The researchers Stenhouse, V. and Jarrett, O. (2012) specifically focused on the presence of empowering pedagogy within the projects; can service learning be a tool of empowerment? They defined empowering pedagogy as consisting of the following factors: problem-posing, participatory, dialogic, democratic processes, research, multicultural, interdisciplinary, activism, affective, and desocializing. While empowering pedagogy is not the same as FoK, they could be used together to meet the goals of culturally responsive pedagogy. Both instructional approaches seek to empower students in some capacity; this study could shed some light on both the effects and instructional details of service learning, as well as ways to use service learning as an empowering instructional tool.

The sample for this study consisted of five cohorts of pre-service teachers (99 in total) who participated in these projects between 2004 and 2009. Approximately 66% of the pre-service teachers self-identified as White, with the rest identifying as (from most to least): Black, African American or African (Ethiopian, Ghanaian, and Liberian), Latina, Indian American, Indian, Asian (Cambodian heritage, Korean American), Native American-White, and Bi-multi-racial. Most of the pre-service teachers were female. The pre-service teachers were enrolled in a two-year urban certification and

Master's program. One of the authors taught the class in which the projects were implemented. They called these projects the Problem-Solution-Project (PSP).

In the first year of the program, the PSP was part of a course on culture, education, and community; it lasted for 15 sessions (each session was 2.5 hours), throughout Fall and Spring semesters. Data sources included email exchanges among cohort members and with the instructor, class members' blog postings, instructor notes on brainstorming sessions, cohort members' end-of-course reflections. These reflections, completed by 82 pre-service teachers, described thoughts, feelings, and ideas related to the PSP process, the chosen project, strengths and challenges.

The researchers analyzed the data in a four-fold recursive process. First, they analyzed the complete data set to construct a general narrative. Then, they went back to the individual reflections from each cohort member and analyzed them for recurring themes. In the third step, the researchers analyzed the data with a specific focus toward what aspects of empowering pedagogy were experienced during the implementation of the PSP. The fourth step was to analyze the data for challenges and tensions.

The researchers found that several aspects of empowering pedagogy existed within the PSP to varying degrees. These aspects included problem posing, participatory, dialogic, and democratic processes -- and were experienced during the process of brainstorming, choosing a problem and deciding on a solution. The projects were situated in pre-service teachers' personal or professional realities, and all participants were involved in research, which helped them establish context, determine feasibility of an idea, and solicit feedback/input to support their project. The PSP process did not strongly address the multicultural and interdisciplinary aspects of empowering pedagogy. The participants consistently engaged in activism by exercising their capacities to engage, resist, or advance their projects in ways that made a difference to themselves and others. The PSP process cultivated affective responses from the participants, which were catalyzed by time, decision-making, and group dynamics (those were the 3 main themes across the sample). One of the challenges experienced by the pre-service teachers in this study was the freedom to exercise autonomy, which was a new freedom for many of the participants. Many of the participants were reluctant for the locus of control to shift away from the instructor and onto them. This relates to the desocializing aspect of empowering pedagogy. The lessons learned from the PSP included: the power to make decisions, the power to lead, the power of group dynamics, the power of a socializing education, which can attempt to counteract the effects of learned habits of resistance, and critical pedagogy and the illusion of shared power when the instructor is seen as more powerful and imposing requirements on participating students.

The researchers triangulated by independently reading and analyzing the data. As a result, the findings are more likely to represent similarities, differences, and themes rather than being influenced by an individual's bias. The researchers analyzed the data using a four-step recursive process that continuously referred back to the research questions. This strengthens the dependability of the study because they clearly describe their analysis process so that it could be repeated by another person. One of the researchers' relationship to the study may challenge the confirmability by increasing the opportunity for biased analysis; since they taught the class where the sample came from, they may have had a different relationship or understanding with the study's participants. It's difficult to know if the interpretation would have been the same had it been done by an unrelated researcher.

This study shed some light on the inner-workings of service learning, identifying ways that the service learning projects embodied empowering pedagogy. It helps me better understand the

challenges associated with engaging students in the process of addressing community problems/identifying community resources. It underscores the value of engaging students in the decision-making process about the service learning project; if the ideas and plans come from the teachers, it is not authentically connecting students with their community's funds of knowledge -- or giving them the opportunity to develop leadership, problem-solving, and critical thinking. Although this study looked at the process for pre-service teachers, it helped me see that not only should teachers explore the community prior to implementing a service learning project; they should also plan ways to authentically engage their own students in the project -- and then scaffold that type of engagement. One of the biggest challenges that the participants experienced was taking on more autonomy than they were used to; I think that students would also experience this as they are probably used to being in a more passive role at school. This raises an important point for teachers considering this type of instruction, as they will need to consciously support students' autonomy through scaffolding and reflection.

The previous studies established service learning as a potential method for connecting students with their community's funds of knowledge, as well as developing their academic and non-academic skills. The following study takes an in-depth look at the practice of service learning within the school community, in order to learn about the experiences of classroom teachers who use service learning as an instructional tool for promoting citizenship. Funds of knowledge are the resources that exist (in part) within students' communities; service learning is an instructional tool that may be an effective method of connecting students with these resources, as well as helping them learn how to make use of them. Researchers Ponder, J., Vander Veldt, M., & Lewis-Ferrell, G. (2011) explored the experiences of classroom teachers who use service learning; they used a qualitative case study design with a constant comparative method to analyze data for recurring themes or common responses about the teachers' experiences. The sample for this study included 12 teachers, with multiple teaching credentials and levels of experience ranging from zero to 25 years with kindergarten through 8th grade, enrolled in a graduate level course taught by one of the authors about Elementary Social Studies Methods. The teachers implemented service learning projects in their classrooms. They did not provide a description of the students involved.

In Stage One of this study, teachers reflected on prior experience with civic involvement, identified hopes and concerns, and planned an outline for implementation. In Stages Two and Three, teachers reflected with other teachers, assessed students' progress, and summarized overall reactions. The researchers conduct a case study of one of the classrooms during Stage Two. In Stage Four, teachers analyzed findings from their service-learning assignment, reflected on the process, and discussed implications for future practice. Results from the teacher's final reflections on the experience showed the following themes: curriculum and real-world connections emerged and standards were met throughout the project, student leadership was critical to the success of the project, partnership with members of the community strengthened the project, and the project increased overall student motivation.

*Meaningful curriculum integration and real world connections:* all 12 teachers reported that natural and meaningful interdisciplinary connections emerged through the project. Two teachers struggled because of principal's adherence to test-pacing guides, although they both noted multiple opportunities to integrate service learning and academic coursework. The service learning projects inspired some students to apply civic responsibility to other issues. *Student leadership:* All 12 teachers agreed that student leadership was essential to the project's success. They reported that

student collaboration led to deliberation, critical thinking, and problem solving. The teachers noted that letting go of control was difficult at first, but that the students rose to the occasion when given the opportunity. They also noted the value of student reflection as a way to monitor progress, understanding, and satisfaction with the level of student leadership. *Community partnerships:* Eight of the 12 teachers mentioned the value of partnerships, such as working with other classes, communicating with parents and administrators, informing the district office about the project, reaching out to local community and government officials, writing letters to businesses, and alerting the media. They stated that these partnerships supported the service-learning. *Student motivation:* All 12 teachers reported increased student motivation and enthusiasm. Some students insisted on extending their projects to address additional issues that arose from their original work. Students were eager to work on their projects outside of class time, showing genuine motivation. *Other findings:* The second phase of the study found that projects that are situated in a real-world context focusing on community needs and student interest can impact students' level of involvement and sense of agency. This phase focused on one classroom, and the data suggested that the students gained civic knowledge, skills, and dispositions.

The researchers describe their sample's range of experience and expertise, and it is broad enough that the findings do not rely on one specific teacher profile; however, all of the members of the sample were enrolled in a graduate level course and completed their participation in this study under the support of the researcher/course teacher. This makes me wonder what kind of support they received from their teacher, and how that may have influenced their approach to service learning. All of the teachers implemented service learning at the elementary level, which relates to my interest as an Elementary teacher -- I can trust that the findings may be similar for other elementary classrooms, although without further research (of a broader sample whose members are independent from one another), it is hard to tell. The researchers used a constant comparative data analysis, which supports the study's credibility by providing a system for analysis that prevents the researchers' bias from determining the themes within the findings.

This study sheds some light on the effects of service learning on students' academic and non-academic development; it also underscores the importance of building community partnerships, which is central to my question. Not only can service learning be used as a method for connecting students with their community's resources, but in order for service learning to be successful, teachers need to connect with the community; there appears to be a reciprocity between service learning and community that could be enriching to my practice.

If service learning is a community endeavor, what are the motivations and perceptions of the communities where it is being implemented? Koliba, C., Campbell, E., & Shapiro, C. (2006) explored the experiences of teachers, schools, and communities that are involved with service learning. Their study uses a collective case study design to investigate the phenomenon of service learning in a broader context. The sample consisted of seven rural schools that were already using service learning in one New England state, five of which had been using service learning consistently for at least seven years. They chose the schools through a process that included suggestions from a statewide service learning coordinator and the head of a rural school network. This study could shed some light on the ways in which school-community partnerships exist, which relates to my question about using service learning as a way to develop these connections. I am interested in learning about how communities perceive service learning, as well as ways to facilitate a positive partnership.

The researchers used a qualitative case study with a phenomenological approach seeking to

understand the nature and purpose of service learning in the context of several schools. Over the course of an academic year (1999-2000), a trained researcher spent at least 14 full days at each school conducting semi-structured interviews with most of the teachers, support staff, school administrators, and a cross-section of parents, students, school board members, and community members who had some exposure to the schools' service learning. Participants were asked about aspects of their school's culture, the relationship between the school and the local community, and the perceived impact that service learning has had on them. Researchers observed classroom settings, service learning projects, and community events and celebrations. The research team participated in common trainings on interview methods and monthly debriefings that addressed methodological challenges – these measures contributed to the study's credibility by engaging the researchers in reflection about their process and findings. The analysis came out of a ground theory approach, meaning that the researchers watched for emergent theory and meaning. The researchers created thick descriptions for each school, and coded interview transcripts into seven basic categories and 48 different subcategories.

The teachers included in these case studies believe that service learning can help students understand their place in the community. Teachers reported that not only did service learning help students understand their community, but also began to see the impact they could have on it. In service learning, the community can become “like a text” through which students learn. Teachers reported that one of the main components of service learning is teaching empathy; that this is an important part of service learning and also help students engage with what they are learning because of the affective connection they develop. Two main themes emerged: service learning can stimulate and support student motivation and empowerment as active learners, and service learning can provide opportunities for metacognition.

The teachers involved in this study agreed that service learning can support students' social responsibility. As students develop social networks and social capital, they also develop an increased sense of connectedness. These gains support students' acquisition of problem solving, communication, and personal development skills which align with the standards used in the state where this research was conducted. Teachers also reported that service learning supports students' development of skills such as collaboration, communication, problem-solving, organization, time management -- which will help them later in life. In addition, students come to understand how their community functions, and learn how to navigate hierarchies and other organizational structures in their community.

One of the primary struggles with implementing service learning is the connection to learning standards. Almost all the teachers interviewed expressed a belief that the current learning standards supported service learning, and that the standards should be viewed as a starting point for rich instruction beyond the classroom. However, there are ways to explicitly connect service learning to the learning standards: at Haddon School, student work is displayed in the hallways along with the stated learning target. Teachers expressed difficulty quantifying the effects of service learning, and rely heavily on teacher observations, classroom dialogue, and student written reflection for assessment, in addition to rubric-based student self-assessment.

The researchers also describe challenges to service learning, including community and school-board opposition, and fear of distracting from the basic skills needed for high-stakes testing. In all cases, the schools were struggling to balance time and pressure from testing and grappling with the question of the role of the school as a community institution.

The researchers provide thick description of all three case studies, and the schools themselves represent a range of community settings. They all focus on elementary/middle school grades, but do not include specific demographic information; they are also all located in the same state. The findings of this study could be transferred to other elementary/middle schools; however, further research could examine service learning in a broader range of contexts. Because the research takes place in a single state, it is hard to know if the findings can be transferred to a different state because of issues related to learning standards, funding, and other educational policies that may be different in a different state. The credibility of this study is strengthened by the inclusion of monthly peer debriefing sessions and trainings on research methods. The authors did not include information on how they monitored their own developing constructions (progressive subjectivity), and they did not provide a negative case analysis. The dependability of this study could be strengthened by more details on how the case studies were conducted. The confirmability of this study is strengthened by the multiple forms of data collection, including coding and researcher training. The authors could further strengthen confirmability by including more information on how they reduced their bias as researchers, beyond the monthly debriefings which seemed to focus primarily on the technical side of their research. What was their role in the schools and community during the research process, and how did they check their developing conceptions with one another to make sure that their findings were really what they presented them to be?

This study provides a glimpse into the world of service learning, and the benefits and challenges that accompany it. It relates directly to funds of knowledge as it describes the partnerships between schools and their communities, which support various kinds of student learning. It also explores students' roles in their communities, and the ways that service learning can facilitate empowerment by recognizing and celebrating students' agency and the wide range of skills that students both bring to and develop as a result of service learning. This study shed light on the ability of service learning to help students learn about their community's funds of knowledge, as well as the potential benefits to students' academic and non-academic development.

**Summary and implications.** These studies revealed overlap in certain areas and differences in others, although themes emerged throughout the five studies. Soslau, E. and Yost, D. (2007) found that service-learning was associated with a slight increase in academic achievement and engagement as measured by attendance and suspension records; however, their data did not show significant differences. Buck and Sylvester (2005) found that teachers could explore the community to discover its strengths and resources in order to facilitate meaningful service learning as a FoK strategy; they also emphasized the value of community partnership. Ponder, J., Vander Veldt, M., & Lewis-Ferrell, G. (2011) found that throughout a service-learning project, curriculum and real-world connections emerged and students met standards, student leadership was critical to the success of the project, partnership with members of the community strengthened the project, and the project increased overall student motivation. Koliba, C., Campbell, E., & Shapiro, C. (2006) found that service-learning could support students' social responsibility development as well as their academic achievement; however, they also found potential challenges in balancing standards-based assessment with service-learning. Stenhouse, V. and Jarrett, O. (2012) found that service-learning could potentially be used in conjunction with empowering pedagogy to support students' development and awareness of the power to make decisions, the power to lead, the power of group dynamics, the power of a socializing education, which can attempt to counteract the effects of learned habits of resistance, and critical pedagogy and the illusion of shared power when the instructor is seen as more

powerful and imposing requirements on participating students. One of the strongest themes that emerged from these studies pointed towards community partnership as a key aspect of effective service learning. My research question explicitly sought ways to use service learning as a tool for connecting with funds of knowledge -- it appears from the research that some of the most important factors are learning about the funds of knowledge that exist in the students' communities, and developing partnerships with community members so that the service learning is meaningful and based in that community's funds of knowledge.

The findings from this section suggested that service learning can deepen student learning and engagement, in addition to facilitating their growth in terms of collaboration, leadership, metacognition, and sense of agency. There are challenges associated with this type of instruction, regarding the extra time it takes to plan and implement. There is also some controversy over the proper role and function of public schools; should schools be spending extra time and resources on non-academic development, especially when the academic stakes are so high? In terms of how these studies relate to our larger question about effective strategies for engaging students' funds of knowledge, they highlight the value of school-community connections and the potential to empower students to participate in community processes, in addition to positioning instruction in the context of students' communities. One of the most valuable pieces of service-learning expressed in these studies was the community connection -- it is this connection that supports students' social responsibility as well as their motivation. Perhaps it is the situation of curriculum in a familiar context that supports students' learning, or perhaps it is that students' become more motivated when they begin to see themselves as more competent, valuable members of their community. These questions lead me to my plans for further research.

While these five studies helped me to better understand the value of service-learning, the main practices that I plan to draw on in the future include researching the community, and working with the community to design and implement projects. Another practice that I can use to effectively implement service learning is to make (and help students make) explicit connections between the service learning projects and the standards on which they are assessed. I am still wondering about the actual techniques involved in designing service learning projects, especially regarding how to involve students in the planning process. My next steps for research will be to seek out teachers who have used service learning as part of an FoK approach. One of the most important ways I can research this process is by getting to know the students I teach, and understanding their developmental readiness for autonomy in the context of service learning projects. As a pre-service teacher, it is hard for me to conceptualize what students will actually be prepared to do, and how to best support them -- for this reason, I will find examples of this type of instruction to create a basis for my own experimentation.

### **Key Insights and Classroom Implications**

As we examined the body of research with the purpose of identifying strategies for incorporating students' funds of knowledge into instruction, we identified common themes and considerations that can be used to support our practice. Contextual variability across findings became one of the key commonalities between the studies. Through our research, we found that there is no single strategy that will always work for all students. Many of the proposed strategies within our research either were not culturally responsive or did not result in student achievement or engagement. For example, Fitts'

study (2009) showed that although the teacher related new concepts to students' funds of knowledge, they routinely used a dominant discourse style and format that was not culturally responsive to many students in the class, making it difficult for them to participate in large group discussions. Many of the studies that did include observations or measurements of responsive, effective instruction were carried out in such a specific context that the findings were difficult to transfer or generalize to other settings. Koliba, Campbell, and Shapiro's (2006) study shed light on the variability of service learning given differences between the school/community context; in communities that were more supportive of service learning, the projects were more successful. The schools they studied had histories of using service learning as a way to connect students with their community -- the principals and teachers were familiar with the practice, and they had already established community partnerships; the findings may be different in a school that hadn't already done this. However, there are several emergent themes that seem to span the breadth of the research: (a) language and communication within multiple contexts, (b) instructional design that elicits or reflects students' cultural values, languages, and ways of relating, and (c) community involvement and connection.

One common theme that we noticed across our research was the centrality of language to FoK and culturally responsive framework (Delgado-Gaitan & Trueba, 2005; Pena, 2000). Language and communication styles are connected to a person's culture, ethnicity, socioeconomic status, and regional origins. When teachers implement FoK strategies that utilize students' languages and communication styles, they create culturally relevant curriculum and facilitate students' code-switching skills to help them build stronger academic and social capital.

During our research, we learned that using students' funds of knowledge involves more than using students' prior knowledge and experience as a way to bridge new learning (Lopez, 2012). In order to be culturally responsive, instructional design needs to involve using students' cultural, ethnic, and linguistic funds of knowledge for sophisticated intellectual tasks, such as analyzing, explaining, critiquing and evaluating (Gay, 2010; Fitts, 2009,).

Through our research, we found that students' communities shape their cultural context, and students in turn can shape their community. Accessing students' funds of knowledge is a cooperative endeavor that requires a certain level of trust between students, teacher, families, and community. In this respect, it is an important part of our practice to make authentic connections with families and community members (Lareau & McNamara-Horvat, 1999; McKenna, et. al., 2013). It also requires that we practice critical self-reflection, in order to ensure that families and community members are receiving the messages that we think we're sending (Gay, 2010). Service-learning is one way to build and deepen connections between school and home (Ponder, J., Vander Veldt, M., & Lewis-Ferrell, G., 2011; Koliba, C., Campbell, E., & Shapiro, C., 2006). By engaging students in the process of solving community problems, teachers can support and empower students both academically and non-academically (Stenhouse, V. and Jarrett, O., 2012; Soslau, E. and Yost, D., 2007).

### **Plans for Further Research**

While we drew several conclusions from the body of research that we reviewed in this paper, further research could deepen our understanding of our question. In our research, we found many studies that focused on teacher and parent interviews, as well as researchers' observations; we'd like to explore more studies that examine students' perceptions in order to gain greater insight into how students perceive their own funds of knowledge as they relate to developing and sharing academic knowledge.

We also would like to explore more relevant quantitative research. Tyler et al. (2008) state that there has been limited amount of quantitative research looking into the existence of cultural discontinuity and how it relates to the academic difficulties experienced by marginalized populations. Further quantitative research could help us to identify specific barriers and access points in implementing FoK strategies by assessing larger populations and controlling for confounding variables. It could also potentially help us identify a more direct correlation between specific strategies and student achievement.

Engaging in academic research is a meaningful way to begin learning about the effects of different pedagogical approaches. However, the student-centered nature of FoK demands that the teacher selects and practices strategies that best support the learners within a specific classroom. In order to truly transfer the findings of the studies that we reviewed, we will need to come to know our own students and their families and communities. As we mentioned in the first part of this conclusion, FoK is a highly contextual approach; for this reason, experimenting with teaching practices that use the lived experiences of students to guide curriculum will be a dynamic process grounded in critical reflection and analysis. But simply incorporating students' experiences and interests into curriculum does not fully encompass the FoK framework. Educators seeking to utilize FoK must consider students' diverse ways of constructing, acquiring, and expressing knowledge in addition to the relevance of the content itself (Gay, 2010). These tenants of students' cultural contexts can serve as guideposts to support a reflexive curriculum that will best meet the needs of increasingly diverse student bodies.

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# Student-Centered Instruction: Purpose, Challenges and Principles

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*Lisa Laughlin, Dan Farr, and Paul Neet*

Student-centered instruction (SCI) is a set of practices that focus on the student as a learner instead of the teacher. Student-centered practices may have positive effects in the classroom and meet the needs of a changing society. We conducted a peer group exploration of the literature around the topic of SCI with three areas of focus. We explored the theoretical reasoning behind SCI, some barriers to implementation, and good practices in the context of a secondary language arts classroom. We researched this area with Ebscohost and ERIC using search terms including *student-centered teaching, student-centered learning, choice, intrinsic and extrinsic motivation, and autonomy support*. An overarching theme found in all three sections was that choice in the classroom is most effective when paired with guiding structure. The first section found that intrinsic and extrinsic motivation are not mutually exclusive, and both have benefits for student learning. For next steps it may be valuable to explore the effect of extrinsic motivation in student learning and its effect on motivation. In the second section we found that a common barrier to student learning in SCI may be students' limited conceptions of the nature of education and learning. For next steps it may be valuable to assess for these conceptions and consider them when providing structure. The third section found that incorporating students' individual interests and passions into instruction may increase engagement. For next steps it may be valuable to explore more specific practices for effectively connecting students' outside interests to classroom motivation.

**Keywords:** *student-centered instruction, motivation, choice, autonomy support, mindset*

In our readings and training about learning theory and pedagogical practices, one of the common concepts we have come across in many places is the idea that traditional instruction tends to be *teacher-centered*, and that modern instruction is shifting toward being more *student-centered*. As preservice teachers, we thought that it would be worthwhile to delve into the concept of student-centered instruction in some detail. We wanted to develop our sense of what exactly student-centered instruction (sometimes shortened to *SCI* here) is, its value, and implementation methods. To that end, our group question for this literature review was the following: *What are the benefits and challenges of student-centered instruction, and how is it best implemented?*

Student-centered practices have been shown to have positive effects in the classroom. Studies have suggested that student-centered teaching increases student engagement and motivation (Gningue et al., 2013; Meece, 2003; Sierens et al., 2009; Webber, 2012). Instruction at the college level has become increasingly student-centered in recent years (Brooks & Young, 2011; Doyle, 2011; Webber,

2012). Therefore, SCI in public schools may have the added benefit of helping students to prepare for the kinds of educational environments they will be engaging with in college. We explored data on the benefits and value of student-centered instruction in this literature review.

While student-centered instruction has been an emerging area of pedagogy for some time, it is of particular significance now because of ongoing changes in educational policy, research on the brain, and economic and cultural forces. Most of the 50 states are in the process of adopting the Common Core State Standards, and there are clear ties between student-centered instruction and many of the complex tasks and processes that students are expected to engage in as part of the Common Core. Meece, for example, refers to “active construction of knowledge through individual inquiry” and “sharing responsibility of learning with students” (2003, p. 113) as key principles of modern academic standards that go hand-in-hand with student-centered instruction.

Neuroscientists’ understanding of the biology of learning has grown greatly in recent years. New research and models increasingly suggest that optimal learning requires active engagement on the part of the learner and instruction that accesses and activates students’ prior knowledge (Zull, 2002). The principles of student-centered instruction seem to be closely aligned with these concepts.

Changes in technology are reshaping the world of work. Jobs that are oriented around simple, repeated tasks, such as many in manufacturing, are on the decline, being replaced with jobs that require greater amounts of creativity, problem-solving, self-direction, autonomy, and communication. Traditional, teacher-centered instruction does not seem to adequately address these skills, and it may be particularly ill-suited for the evolving economy that today’s students will find themselves in upon graduation.

The U.S. population is becoming increasingly diverse. Student-centered instruction is of particular importance in diverse populations—as students approach lessons from increasingly diverse backgrounds, perspectives, values systems, areas of interest, and knowledge bases, it becomes that much more important to provide a multiplicity of entrance points, perspectives, and ways of engaging with material (Guiffrida, 2004; Ivey & Broaddus, 2001). One of the best ways to ensure that content and instruction are relevant to a diverse group of students is to give the students themselves an important role in crafting the learning experience.

The literature we reviewed studied and described many potential benefits of student-centered instruction. Some of the key benefits were improved self-management skills (Lanskey & Rudduck, 2010), increased engagement (Webber, 2012; Meece, 2003), and a deeper sense of competence (Patall et al., 2010).

**Common Issues and Points of Disagreement.** While numerous studies have pointed to a range of benefits of student-centered instruction, it appears that a range of barriers have often made its adoption challenging. There are questions as to how student-centered instruction is best implemented, as well as major difficulties in implementation. One of our goals in this paper is to explore some common disagreements, controversies, and road blocks in this area.

If we are to move from a teacher-centered orientation to a student-centered one, then what, precisely, is the role of the teacher? While autonomy and individual choice are important parts of SCI, some studies have suggested that it is still important for teachers to provide clear structure and scaffolding to help students to understand their responsibilities. If there is to be a major shift in how students engage with content and lessons, then they need support from teachers to help them to engage properly and learn the practices that are necessary for success.

As with any emerging pedagogy or practice, student-centered instruction can face resistance or confusion from instructors who are used to a particular way of doing things. Similarly, students can struggle with developing their metacognitive skills, making more choices in the classroom, and adapting their mindset to a new paradigm. We've endeavored to unearth the dispositions and learning environments that are necessary for successful implementation.

Brooks and Young (2005) concluded that students need consistency in the classroom (particularly in terms of the educator's principles and policies), while Garrett's (2008) findings suggested that consistency is less important than creating a classroom environment that reflects the teacher's dispositions. There seems to be disagreement about the degree to which presence or lack of consistency affects, aids, or hinders student-centered instruction.

In this literature review, we have attempted to explore all of these issues in order to develop a beginning sense of current understanding of SCI. We conducted our research using Ebscohost and ERIC, using search terms including *student-centered teaching*, *student-centered learning*, *student-centered instruction*, *choice*, *intrinsic* and *extrinsic motivation*, and *autonomy support*.

**Structure of Paper.** The central focus of this paper is to review and explore the literature on student-centered instruction in order to highlight practices and principles for its effective implementation. To that end, we have divided the body of our inquiry into three sections, which build sequentially to explore the value of student-centered instruction, challenges, and specific practices for its implementation.

In the first section, we explore literature on the value and purpose of student-centered instruction. We highlight the apparent benefits that student-centered instruction presents in areas such as intrinsic and extrinsic motivation, choice, and autonomy. We present an overview of why student-centered instruction is a valuable pedagogical model.

In the second section, we move from the value of student-centered instruction to challenges to its implementation. Some instructors and students have seen inconsistent success with these practices. We explore some of the pedagogical and instructional tools, teaching dispositions, and environmental factors that can help or hinder student-centered instruction. Here, we look for common errors and challenges, and why they emerge.

In the third section, having discussed the value of student-centered instruction as well as challenges, we shift our focus toward implementation strategies. Building on the theoretical and conceptual ideas of the previous sections, we look for some practical rules and best practices for student-centered instruction, with some examples for implementation in specific contexts.

**Definition of "Student-Centered Instruction."** Before the main body of our inquiry, it is necessary to discuss in some detail what, exactly, we mean when we speak of student-centered instruction. Many of the authors and researchers we have read define the concept in slightly different ways, although there are certain elements that appear repeatedly. Cubukcu defines student-centered instruction as "the arrangement of the teaching experience focusing on the students' responsibilities and activities in the learning process which takes into consideration the students' interests, demands and needs" (2012, p. 49). Sierens et al. emphasize certain teacher practices, including autonomy support, empowering students to construct their own knowledge, giving students choices, providing a rationale when choice is constricted, empathizing with the learner's perspective, and avoiding controlling language (Sierens et al., 2009).

While different writers give more or less weight to different elements, it seems to us that the core recurring elements of student-centered instruction are the following (to clarify the ideas, they are

paired with their opposites in teacher-centered instruction): *Students make choices, both in what the content is, and in how to express understanding* (as opposed to both being entirely teacher-determined). *Students actively engage with questions and problems in order to construct their own understanding* (as opposed to the teacher or a textbook providing answers). *Instruction and curriculum take students' backgrounds, prior knowledge, needs, and interests into account* (as opposed to instruction and curriculum being rigid and non-responsive). *Instruction is connected to the community and outside-of-school applications in order to help students to pursue learning for their own, intrinsic purposes* (as opposed to emphasizing grades or other extrinsic rewards).

**Limitations.** Over the course of our literature review, some notable limitations emerged. While we found a wealth of relevant information, we did not find everything we were looking for. First, we found a good deal more quantitative studies than qualitative ones. Second, while one of our significant areas of interest was the dispositions and mindsets that are necessary to cultivate in students to help them to engage in student-centered work, we did not find studies that were specifically about this topic (although several address it to some degree). Third, while all three of us are planning to work at the high school level, quite a few of the studies we found deal with college students. While these studies are valuable, since part of our job as high school teachers will be to prepare our students for college, this limitation does bear mentioning, since there are significant differences between high school and college instruction. Fourth, we did not find as many studies that recommend specific practices as we would have liked. We found many *articles* with specific pedagogical advice, but fewer actual studies.

## **An Exploration of the Value and Purpose of Student-Centered Instruction** *by Lisa Laughlin*

In this section I explored the value of student-centered instruction (SCI) and some of the theories behind its effectiveness or ineffectiveness in the classroom. Going into this project I wanted specifically to understand whether student-centered instruction methods are the best choice for my classroom and why. I wanted to explore whether, by giving students more control in the classroom, I could help them to feel more in control of their own learning and therefore more engaged and genuinely interested in what is happening in the classroom. I wanted to find out, if that is true, why does choice or autonomy support in the classroom lead to higher levels of engagement and interest?

When conducting research for this section, I mainly used Ebscohost to locate materials using these search terms: *student-centered teaching, student-centered learning, choice, choice in the classroom, intrinsic motivation, extrinsic motivation, and autonomy support*. I also searched for specific author names (Kolb, Deci, and Lepper) after noticing that their work was heavily influential on the authors I had already identified. The research I have identified within this project gives some insight into the areas of intrinsic and extrinsic motivation, autonomy support, choice, the alignment of classroom policies, and student engagement.

**Intrinsic and extrinsic motivation.** One of the first themes I noticed in my research was the difference between intrinsic and extrinsic motivation. Students are differently motivated by the reasoning behind what they are working on. Two of the studies I examined discussed this theme.

In the study by Vansteenkiste et al. (2004) the researchers hypothesized that when individuals learn concepts or activities for intrinsic goals (relating to relationships, community, health, and/or

growth) there is deeper processing, higher test performance, and higher levels of persistence than when learning is for extrinsic goals (related to image, wealth and/or fame). Theoretically, students would put forth more effort and retain information for longer if their reasons for learning are intrinsic. The researchers cite self-determination theory (Deci and Ryan, as cited in Vansteenkiste et al., 2004) as their basis for this hypothesis.

The researchers also theorized that people in general will be happier (psychologically and in relationships) if they focus predominantly on intrinsic as opposed to extrinsic goals.

The researchers tested their hypotheses using three quasi-experiments with surveys to collect data. The researchers re-wrote the instructions for a large assignment and randomly distributed the four different versions evenly amongst the students. The four versions reflected four different paradigms: (a) intrinsic goal conditions, (b) extrinsic goal conditions, (c) autonomy-supportive conditions, and (d) controlling conditions.

The specific hypothesized outcome of this study was that intrinsic goal framing would negatively affect self-reports of superficial processing. In other words, students will be more honest about where they are in their learning. Rather than merely trying to memorize information, students will seek actual understanding of the material, because they are learning for a genuine self-held reason.

Autonomy-supportive context would also negatively affect self-reports of superficial learning. This means that when students are allowed to guide their own learning, they will most likely strive for authentic learning.

The researchers conducted the study three times in three different classroom environments in Belgium. In the first study the researchers chose to survey 200 Belgian pre-service pre-school teachers, all of whom were female. The subject matter of the project was recycling. The researchers administered a survey to the participants and used a previously developed four-point scale to assess the responses. The subscale responses were aggregated according to the relative-autonomy continuum and combined to form an autonomous motivation composite. Using this method of assessment, this first study initially confirmed the theories the researchers held about intrinsic versus extrinsic learning/goal framing. The study showed that students in a recycling class with more autonomy-supportive language tended to be more motivated to explore outside of the class and learn more about recycling.

For the second study the researchers chose 181 male and 196 female marketing students at a Belgian college. This selection was intended to extend to a different content area (the subject matter in this study was business communication styles) and to include male subjects. This study supported the result of study 1 (that autonomous supportive language more effectively motivates student performance) and extended it by applying it to a new subject matter and including men in the study.

In the third study the researchers applied their methods to 111 female and 113 male high school students participating in a Tai-Bo class as part of their regular physical fitness education class. These results further supported those of the first two studies, extending the results to a third subject area and a new age group of students.

The first participant group consisted entirely of female participants, which would negatively affect generalizability if that study stood alone, but the following two studies were conducted in classrooms containing male participants as well as female participants. Another possible generalizability issue is that the researchers do not identify whether the three settings are urban,

suburban, rural, or a combination. This could have an effect on the results and might be a factor to consider in this type of study.

I think the biggest threat to internal validity for this study is experimental treatment diffusion, because the researchers did not specify that the students should not talk about the differences in their project instructions. The researchers state that each of the instructions were about the same length, so they looked the same at first glance, but nothing was in place to hinder students who noticed the difference from discussing it outside of class.

The results of this study indicate that the use of intrinsic motivation seems to not only lead to high achievement, but actually leads students to deeper comprehension of their subject material. Students often took extension activities or engaged more with a text when presented with a task using autonomy supportive language and intrinsically motivated goals. Students in the autonomy-supportive/intrinsically motivated group tended to be more interested and motivated to learn about the subject-matter presented.

If students tend to perform better under the context of intrinsic motivation coupled with autonomy-supportive language, then the variable that educators will have the most difficulty bringing into the classroom is the intrinsic motivation, because the student is in control of his or her own motivation. From this vantage point one may want to know the trends that are commonly found in association with intrinsic motivation in students.

A study by Lepper et al. (2005) looked at a previous study and found that across elementary and middle school grades, students seem to move from being primarily intrinsically motivated towards primarily extrinsically motivated. The origin of this shift, however, was unclear. Less related to this project, but nonetheless a secondary focus of this study, was to understand how intrinsic motivation is understood in cultures in which the self has been hypothesized to be more intertwined with significant others.

To answer these questions the researchers surveyed 797 third- through eighth-grade students from two public school districts in the San Francisco Bay Area. The researchers used a scale of intrinsic versus extrinsic orientation in the classroom. Of the participants, 577 were from an urban district, and 220 were from a suburban district.

The researchers were simply conducting a survey of students, so concerns of control and experiment groups do not apply. One issue could be statistical regression, as when selecting the participants for the study, the researchers focused on selecting a roughly equal number of male and female students, an equal number of students from each of the five grade levels surveyed, and that the students' ethnic identifications were representative of the area in which the researchers were studying. The issue with this selection is that the researchers do not report students' test levels or achievement levels, and the study may have higher numbers of students from the extreme ends of the achievement scale, which could affect the results.

The researchers discovered that intrinsic and extrinsic motivation can be thought of as two separate but related constructs instead of as two polar ends of one spectrum. In other words, strong intrinsic motivation does not mean a student is not also motivated by extrinsic factors. The researchers also found there was a strong correlation between high levels of extrinsic motivation and a preference for easy work.

Overall, the results show a need to attend to both intrinsic and extrinsic motivation in the classroom, as they can and frequently do coexist. This contrasts with the results found in the study by

Vansteenkiste et al. (2004), which seemed to view the concepts of intrinsic and extrinsic motivation as incapable of coexisting.

The researchers found intrinsic motivation to be highest with the youngest students (3rd graders) and lowest with the oldest students (8th graders). The researchers noticed the decrease resides mostly with the subscale that measures the need to be socially desirable and they hypothesize that it is the student's need to feel socially desirable and not their actual intrinsic motivation that decreases. It seems logical that as a student becomes older the student would tend to become more independent. This tendency to move away from social desirability, or lack of need to impress one's elders, could signal that autonomy support is exactly what is needed to help guide students to become more independent and self-guided thinkers and learners.

**Autonomy support.** To return to the study by Vansteenkiste et al. (2004), the third study applied the concepts to a high school classroom with success. It seems that results in regards to autonomy supportive language (non-controlling language) would be particularly transferrable to the high school level. Following the logical progression of learners developing a lower need for social desirability and a higher level of independent learning would lend students to respond favorably to autonomy-supportive language. The researchers found in study 3, similar to the first two studies, that an autonomy-supportive context tended to raise both intrinsic and extrinsic motivation. The researchers only discuss the implication of increased intrinsic motivation, and though the levels of intrinsic motivation are a much more marked increase, it does seem that with autonomy support, students may experience a slight increase in extrinsic motivation as well.

Another study explores the benefits of using autonomy-supportive language in the classroom through the implementation of student choice.

**Giving students choice in the classroom.** In a study by Patall et al. (2010) the researchers theorize that when students are provided with choices of homework, enhanced intrinsic motivation will result. The researchers based their theory that choice would have a positive effect on motivation on Deci's self-determination theory.

The researchers utilized pre-service teachers in 14 classrooms from two urban high schools in a southeastern state to administer the choice or no-choice conditions to their students. The study was conducted twice. Using what the researchers describe as a crossover method, the control and experiment student groups switched for the second iteration. (A more complete examination of this study is found in section three of this paper.)

The results indicated that students experience a slight increase of interest, enjoyment, and self-perceived competence when presented with choice in regards to homework, as opposed to no choice.

Students tended to complete more of the homework when presented with choice, but there was no effect on the amount of effort put into completing the homework. The researchers found that student perceptions of receiving autonomy support from their teachers predicted intrinsic motivation for school. These findings line up with the data from Lepper et al. (2005) and Vansteenkiste et al. (2004) as they reflect the high school age students as valuing independence in their learning through autonomy support and that the supply of that autonomy support creates an intrinsic desire for learning.

This study also seems to show that the use of choice in the classroom can be an effective motivational tool for getting students interested in aspects of the learning experience that they are sometimes uninterested in, such as homework.

The understanding of intrinsic/extrinsic motivation differed from Vansteenkiste et al. (2004) a bit, because where Vansteenkiste et al. looked to see whether intrinsic or extrinsic motivation resulted in higher student engagement, Patall et al. built on the understanding that intrinsic motivation was the goal and explored one specific method of getting students intrinsically motivated to learn.

Another study that explores the concept of choice is by Brooks and Young (2011), in which the researchers wanted to know what the impact of student choice is on motivation in the classroom. The researchers were inspired to conduct this research because previous research indicated a connection between student choice and motivation. They wanted to clarify the relationship between motivation and learner empowerment.

The researchers included 419 U.S. college students who were enrolled in several different courses that either did or did not give students choice in the classroom. The researchers selected eight classrooms: 4 in which the instructor routinely gave students choice-making opportunities, and 4 in which the instructors did not. Without changing the given conditions, the researchers surveyed the students enrolled in the classes. (A more complete examination of this study is found in section two of this paper.)

Student responses from this study indicated that intrinsic motivation is positively linked with learner empowerment and further supports the trends that have been consistent in the previous studies. Particularly, the data supports the notion that providing choice in the classroom leads to higher intrinsic motivation. The study did have some interesting data that supports discussion on a new theme of exploration in this paper: the need for alignment of classroom policies.

**Need for alignment of classroom policies.** The data from Brooks and Young (2005) demonstrate how a teacher's assignment structure or attendance policy may influence a student's intrinsic motivation. The researchers noticed in the data that students in a class in which attendance was mandatory and who had little to no choice on assignments tended to have higher intrinsic motivation, whereas if the students had more latitude on assignments but still had a strict mandatory attendance policy, they tended to have higher extrinsic or amotivation levels.

The results of this study seem to indicate a need for the two policies (assignment structure and attendance) to be aligned. In the surveys, the researchers found that part of this conundrum was that instructors with a voluntary attendance policy were perceived to care less about their students than instructors who implemented a mandatory attendance policy. This information indicates that students need educators who can be both supportive and freeing.

It seems that the results of this study show that students have a need for consistency in classroom policies; that students need to see the educator's guiding principles reflected in the structure of the class.

In a case study examination of learner-centered teachers and their classroom management techniques, Garrett (2008) seems to be taken with the idea of the need to align classroom policies with teaching policies. The researcher seems to be intrigued by the contradictory behavior of implementing a curriculum that encourages decision-making and autonomy and a management system that demands obedience. She hypothesizes that teachers will adapt their management style to mirror their style of curriculum when teaching a student-centered classroom.

To conduct her case study Garrett gathered information about the teachers by administering a data collection sheet to the teachers that inquired about their "*pupil control ideology*" (Garrett, 2008) once before and once after observation. She also observed in the classrooms (non-participant) and

conducted tape-recorded interviews with each teacher. She then gathered her data and looked for commonalities or disparities in the classroom management of the student-centered teachers.

There does not seem to be a significant limit to transferability with this study, as the researcher used thick description within her article and used three separate cases. The only limiting factor to transferability is that she only conducted this research in one school, and that school is a suburban K-6 science and technology magnet. The school is designed to serve a specific community and might have some practices that are not common to the average pub

The study had somewhat of a prolonged/substantial engagement as it was conducted over an 8-week period. The accuracy of the reflection of each teacher's values, beliefs, and input seem to be rather reliable, as member checks were utilized in the tape-recorded interviews. Peer debriefing was not utilized in this research, as there was only one researcher conducting the study, which had a negative effect on credibility. The researcher also collected the data in multiple ways, using triangulation to further ensure accuracy in her results.

She found that none of the teachers in the study focused on trying to have a match between their instruction and classroom management. She found that 2 of the 3 teachers used methods that were mostly student-centered while the third teacher used methods that were mostly teacher-centered.

The data suggests that classroom management may or may not be affected by whether or not a curriculum is student-centered or teacher-centered. One of the teachers in this study implemented teacher-centered classroom management alongside a student-centered curriculum in an effective manner. The most important idea presented in this study might be that classroom management is a tool used by an instructor and the success or failure of the tool depends mostly on the operator.

**Student engagement.** In a three-year study by Gningue et al. (2013), researchers explored the use of student-centered learning strategies to increase student engagement in math classes, the theory being that by increasing the teacher's content knowledge and student-centered pedagogy knowledge, the teachers would be able to better engage their students in learning.

The results pertinent to our study posit that when student-centered practices are used, student engagement tends to go up, or more specifically the study showed that student disengagement went down. The researchers were looking for specific practices that can definitely be transferred to my classroom.

Testing and/or instrumentation is a possible threat to internal validity in this study, as the design uses a similar pre- and post-test to measure the content and pedagogical knowledge. If the post-test was too similar to the pre-test the subjects could have become test-wise, but if one test was significantly more difficult the results would then be skewed. The fact that the teachers were self-selected for this program could be a limit to generalizability, because the teachers themselves may be more pre-disposed toward self-improvement. The reliability of this study is high because they used observers that were separate from the instructors of the 90-hour content and pedagogy class, and hired retired professionals from the field to conduct the observations.

This study re-emphasizes the link between content and pedagogical knowledge. It looks at how student engagement can be boosted through a combination of improvements in technique and student-centered pedagogical knowledge. The study further identifies student-centered practices by specifically looking at *small group discussions, class discussion, hands-on activities, cooperative learning, student presentations*, and the use of a learning center or station.

The study further investigates the results by comparing the classrooms that use the most student-centered practices against the classrooms that use the fewest and looking at the levels of student engagement between them.

Throughout this study I observed several key themes that emerged throughout the research: intrinsic and extrinsic motivation, autonomy support, choice, the alignment of classroom policies, and student engagement. Throughout those themes have been undisputed claims, as well as some conflicting reports. An area I would be interested in researching further would be whether extrinsic motivation has a positive or negative effect on student learning and what applications that might have in the classroom.

After this area of research, we wanted to understand what the challenges to implementation might be. The next section explores these challenges and possible solutions.

## **Challenges and Barriers to Student-Centered Instruction**

*by Dan Farr*

This section of our inquiry transitioned from research exploring the benefits and reasons for Student-Centered Instruction (SCI) to challenges of and necessary conditions for the successful implementation of SCI. My own classroom experience has included struggles with engaging students with student-centered practices like metacognitive assessment and instructional choice. The analysis of student learning and reflections I engaged for the edTPA indicated that the students who did evidence learning were motivated by extrinsic factors such as grades and parent/teacher conferences. Students had not responded to my attempts at student-centered practices with the benefits described in student-centered theory/ literature.

An initial survey of the literature (Brooks & Young, 2011) showed inconsistent success in the implementation of SCI. Both the literature and discussions with more experienced educators have suggested that SCI requires certain mindsets or dispositions of students and teachers and corresponding conditions of the learning environment. A more careful study of the research surrounding the implementation of SCI might help me identify these skills, mindsets, and environmental factors necessary to empower students to be reflective and construct their own knowledge. With this knowledge in hand, I might be able to address my needs as a teacher, scaffold the skills and dispositions needed by students and create the kind of classroom environment necessary to use SCI effectively.

As outlined in the previous section, SCI has great potential to help students develop into autonomous learners, capable of constructing their own understandings. These skills can help students find success in academics, careers, and all aspects of their lives. By discovering and understanding current barriers to the successful use of SCI, I might be able to develop methods of removing or scaffolding over them.

Following, are the reviews of four of the research articles I chose to help build my knowledge of barriers to SCI. They were selected from database searches using search terms such as *student choice*, *student centered teaching*, *self-determination theory*, and *student motivation*. Many of the relevant studies were both original research and literature reviews. This helped inform my knowledge and led from general search terms regarding SCI to more specific terms relating to relevant research. They were searched in Ebsco host, J-Store, and the Summit combined catalogue.

The studies focused on and measured different aspects of SCI involving some form of student choice. As expected, the results were often inconsistent or inconclusive, but pointed toward possible barriers stemming from fear, lack of structure in the classroom, and the epistemological conceptions students bring with them to the classroom. The most relevant studies tended to be quantitative research by university researchers focusing on higher education. These were mostly controlled experiments conducted on large but localized (one or two school) populations. Exceptions to this are represented in the first and last articles reviewed. These two are quantitative case studies where researchers focused on both the student and teachers' roles in SCI.

**Review of studies.** The First of these case studies was published in an article titled *Resisting Erasure: Cultivating Opportunities for Humanizing Curriculum* (Burke, Adler, & Linker, 2008). The researchers here sought to discover the personal and institutional barriers to developing and implementing a student-centered (localized, culturally relevant) curriculum in high poverty urban schools? While the study aimed at focusing on five teachers and their students, their findings regarding barriers to SCI were focused on the teachers and their administrators.

Burke et al. cite the national push for standardized curriculum, and the *No Child Left Behind Act* as having put extra punitive pressure on high-poverty schools who typically score low on the standardized tests that measure progress on standardized curriculum and learning goals. They argue that the standards for academic success have been formed from within a middle-class, mainstream mind-set and don't reflect the cultures and value systems of low-income urban communities. According to Burke, incorporating this standardized curriculum had a dehumanizing effect on the subject students and put undue pressure on their teachers whose decision making ability and professionalism had been devalued. By identifying how these forces manifest in personal and institutional barriers to learning, the researchers hoped to work with the focus group teachers to create more student-centered curriculum and empower both the students and teachers in the school.

This was a qualitative research project that grew out of a collaboration between a team of university researchers and teachers from Tanglewood, a high poverty (88% qualify for free or reduced lunch) urban school. The first of two stages consisted of semi-structured interviews with 28 teachers and 4 administrators, classroom observations, and focus group interviews with 80 students from 8 classrooms. The second phase of this research consisted of the university researchers collaborating with 5 volunteer Tanglewood teachers to develop and implement localized/ humanized curriculum and lesson plans. By working with these teachers and trying to incorporate the teachers' knowledge of their students, the researchers became aware of personal and institutional barriers that were actively preventing the teachers from using their knowledge and expertise to transform their practice.

The researchers seem to have gone into this collaborative work without a precise method for deciding what to look for or who the participants would be. The project became very much a case study where the circumstances of very few individuals (five teachers and their administrators and students) were analyzed. The five teachers who were used were those that volunteered from the original 28 teachers interviewed.

The institutional barriers identified by the study stemmed from policy that was reactive to outside pressure and did not reflect local context. They concluded that this takes place when administrators react to poor test scores by mandating curriculum identified from outside authority as "best practice." This prevents teachers from being able to use their knowledge of their students to humanize learning.

The personal barriers identified stemmed from the separateness of cultural experiences between Tanglewood students and teachers. While teachers had a lot of personal knowledge of their students, this knowledge was obtained in the classroom. Most teachers came from and lived in suburbs outside the district and viewed themselves as outsiders. Because of this, they had no contextualizing experiences to place their knowledge of their students in. These teachers reported perceived hostility coming from the parents of their students and did not feel safe taking the personal risks necessary to cultivate the experiences where they could see their students in authentic cultural contexts.

This qualitative study formed its conclusions from focusing on a very small set of teachers and their classrooms. My ability to transfer their findings about institutional and personal barriers to my future teaching practice hinges on the thickness of their descriptions. While basic demographics were given for the student population, (the five teachers are said to come mostly from outside the urban area where students live) little demographic information was given about them. This is a significant limiting factor on my ability to transfer findings because the number of teachers was so small, and because the cultural differences between students and teachers were central to the teachers' personal barriers to implementing student centered practices.

The research seems to have gone on long enough to support credibility of the findings (a full year), but a lack of detail about methods makes it difficult to see how the conclusions drawn follow facts and logic (confirmability) or are dependable. For instance, how did the researchers conclude that the focus teachers were not familiar with their students' cultural identities outside of school, and what did the teachers report that led to the conclusion that they were fearful of engaging with the students' culture outside of school?

Because my classroom setting is in a high poverty area, and cultural relevance is central to the question this literature review engaged, the purpose and discussion in this article are very relevant to my study. Is mandated curriculum affecting the ability to engage in learning for my students or those of other teachers? Does my lack of knowing students in their authentic cultural contexts create a barrier in my ability to create humanizing curriculum? The limits in the ability to transfer or confirm the findings in this study mean that I need to look for corroboration in other studies and through my own teaching practice.

The next study reviewed looked at the perceptions of students instead of teachers regarding a central aspect of SCI--choice. The researchers (Brooks & Young, 2011) sought to examine the effectiveness of student choice through the theoretical framework of Self-Determination Theory (Reeve, Deci, and Ryan, 2004, p. 33, as cited in Brooks & Young, 2011). They sought to answer the following two specific questions: What is the relationship between motivation and learner empowerment? What is the impact of student choice on motivation and empowerment?

The bodies of research on motivation and learner empowerment have focused on many of the same factors such as self-efficacy, values, goals, interests, and self-determination in educational contexts (Brooks & Young, 2011). However, the researchers point out, that there has been very little research on the relationship between these two constructs. Such a relationship may be important because both motivation and learner empowerment point to choice making opportunities for students which, according to the authors, become more prevalent as students transition from secondary to higher education.

This was a quantitative study conducted through survey questionnaires administered to 419 students (295 female, 122 male) on a single large U.S. college campus. The students surveyed were

from a large array of course disciplines and varied in age from 17 to 46 (mean age = 20.32). The article does not indicate which college campus was used, or how it or the students were chosen. However, the large array of classes and the disproportionate number of female to male students suggest random sampling.

The survey questions were designed to test two hypotheses: (a) levels of intrinsic motivation are highly positively correlated with learner empowerment, and (b) levels of extrinsic/amotivation will be highly negatively correlated with learner empowerment. The survey also aimed to answer two research questions: (a) Is student choice on assignments and on attendance associated with student motivation, and (b) Is student choice on assignments and on attendance associated with student empowerment.

The surveys were completed in 4 classrooms where students were not offered any choice in terms of assignments and in another 4 classes where many different forms of choice-making opportunities were given for completing assignments. Attendance policies were analyzed separately following data collection.

The two hypotheses predicting correlations between motivation and empowerment were both correct. There was a strong positive correlation between intrinsic motivation and empowerment measures, and a strong negative correlation between extrinsic motivation and empowerment.

The researchers were surprised to find that students felt motivated and empowered when choice in assignments and attendance were given and when choice was not given for assignments or attendance. The findings suggest students did not feel empowered when choice was inconsistent: choice in assignments but not attendance, or choice in attendance but not assignments. The researchers conclude that feelings of self-efficacy are strongest when structure is known and predictable.

This qualitative study was intended to be generalized to students in higher education. While the sample size and distribution seem adequate, the fact that the study took place at one school may have affected whether U.S. college student demographics were adequately represented. More importantly, the focus population is college students and my concern is for secondary education students. However, findings are related to correlations that are easily tracked and confirmable in the detailed methods description and the fact that the researchers were surprised by a correlation helps affirm objectivity.

While I can't generalize the findings to my focus (secondary students), I may be able to consider them in my situation if I stay cognizant of the fact that the maturity and level of experience in my students might affect how students react to choice and consistency. The findings suggest that a lack of structure or inconsistency in the level of structure provided may be barriers to college students' motivation in learner-centered environments. It seems likely that structure and consistency would be more important for younger students. The final two articles in my review were scrutinized with an eye toward the way choice was structured to look for corroboration of Brooks and Young's (2011) findings.

The first of these articles surprised its authors with negative learning outcomes when choice was offered and focused on autonomy support- the language and actions of teachers that communicate student-centeredness and constructivist learning. In *Effects of Autonomy-Supportive Teaching on Student Learning and Motivation* (Furtak, & Kunter, 2012) researchers sought to learn the effects of procedural and cognitive autonomy-supportive teaching on student learning and motivation in reform based (inquiry based student-centered) science instruction.

While reform based science instruction is becoming widely adopted in U.S. public school policy, it has proven difficult to implement (Furtak & Kunter, 2012). The theories behind reform based learning (cognitive engagement, and student motivation) are widely accepted, but various opinions regarding the type of autonomy support students need to effect motivation and student learning have led to inconsistent success.

The researchers use a theoretical framework proposed by Stefanou, Perencevich, DiCintio, and Turner (as cited in Furtak and Kunter, 2012) to differentiate among different kinds of autonomy support. Furtak & Kunter condense this framework into the categories of procedural autonomy support--where students are given decision making power over materials, research instruments, etc., and cognitive autonomy support--where students are allowed to find multiple solutions to problems, and are given informational feedback to support the self-evaluation of their work. The researchers believed that distinguishing between and testing these types of autonomy support might reveal what students really need to be motivated and engaged in reform-based learning.

This was designed as a quantitative true experiment that used 4 treatment conditions: *high procedural-low cognitive support*, *high procedural- high cognitive support*, *low procedural- low cognitive support*, and *low procedural- high cognitive support*. A fifth control group did not receive any instruction but took a pre and post-assessment as did all participants. All 51 participants were in the 7<sup>th</sup> grade at a single English language school in Germany. Participant groups were assembled using random sampling-stratified on the basis of pretest scores and English proficiency. The four treatment conditions were adapted to a single science lesson template. Two instruments were used to determine findings, a pre-and post-test, and a questionnaire aimed at determining student perceptions of each treatment and its effect on motivation.

Contrary to the researchers' hypotheses, students who received a high level of cognitive autonomy support reported more negative experiences than students in the low cognitive autonomy-support treatment groups. These students perceived less choice, and more controlling behavior. Procedural autonomy support showed no significant effect on student perceptions.

Analysis of test scores showed that the largest pre-and post-test effect on scores came from the low cognitive autonomy-supportive treatment groups, with the largest signs of growth attributed to high procedural and low cognitive autonomy-support. However, the high cognitive autonomy-support groups showed a higher level of learning from the pretest to a follow-up test (given three months later) than from the pre-test to the post-test (given immediately after instruction). This effect was greatest for the high procedural, high cognitive-autonomy support treatment group. The researchers suggest that they did not succeed in actually creating cognitive-autonomy supportive environments in their treatments because students in the high cognitive groups reported low levels of motivation. Autonomy supportive environments are--by definition--motivating.

This was a quantitative study that took place in a single and relatively unique school. I believe the researchers intended the results to be generalizable to secondary science classes in public schools. However, the contextual and cultural uniqueness of the student population was not addressed in their sampling. The educational backgrounds in regard to autonomy support or student-centered skill sets were not addressed in any description. Such backgrounds are important to understand for my purposes of identifying barriers to student-centered teaching. The lack of detail about the unique setting restricts generalizability.

The researchers did rigorously ensure internal validity. The stratified-random sampling method described takes student language skills and pre-instructional content knowledge into account

to ensure equal distributions in all treatment groups. They also take great care to ensure that the research is objective. Teachers for the treatment groups were unaware of the research content or objectives and lessons were video-taped and analyzed to ensure that the intended levels of autonomy support were given.

I believe that that the research and results were reliable. Significance testing was used and described in detail for analyzing data. Criteria for defining high and low levels of autonomy-support were clearly described and their implementation was highly scrutinized and analyzed through video using a coding and rating system.

However, as the researchers point out, their methods of supplying high levels of autonomy-support may not have been successful. Since autonomy support is largely about student perceptions (Patall et al. 2010), and student perceptions of the support offered did not include the criteria described in autonomy theory, the authors seem correct in asserting that they failed in enacting autonomy support. While this negates the value of the intended research findings, it should be valuable to analyze the recorded dialogue of student/ teacher conversations provided in the article. These recorded conversations are categorized by what the researchers intended to be the 4 different treatments of varying autonomy supportive categories. There seems to be similarities between what these researchers consider procedural autonomy-support and what Brooks et al. (2011) discuss as structure. Looking at the failed methods used to provide cognitive autonomy support in light of the relationship Brooks et. al. (2011) identified between autonomy support and structure gives insights into why attempts to provide autonomy support failed in this study. It is possible that student perceptions of choice were low because “high cognitive autonomy support” didn’t take students’ needs for structure into account. Reading through some of the recorded student/teacher dialogue suggests that students had no direction-giving structure to fall back on when they became unsure.

The final reviewed article in this section sheds some light on why for some students, this lack of structure may form a formidable barrier. It also explores the reasons teachers’ lack of knowledge about their students may be implicit in creating such barriers. In *Reaching the Students that Student-Centered Learning Cannot Reach* (Hockings, 2009) the researchers seek to learn how sociological, epistemological, and approaches to learning theoretical frameworks may help explain why SCI is ineffective for some students. The study follows up on a previous research study concerning student-centered learning in which Hockings concluded that 30% of students in a student-centered environment engaged in only surface-level learning (Hockings, 2003). Of these students, half (15%) engaged deep-learning in other contexts, but not in her student-centered environment.

The current study was intended to investigate why student-centered strategies had appeared to be excluding these students. By applying the data from the 2003 study to three separate theoretical frameworks, Hockings (2009) hoped to begin the process of developing a comprehensive framework for evaluating classroom practice and learning. She applied the student data to sociological theories concerning the relationship between participation and identity, epistemological research concerning the relationship between absolutist/ authoritative conceptions of knowledge and surface-level learning (Saljo, 1997, as cited in Hockings, 2009), and approaches to learning research concerning received knowledge vs. constructed knowledge (Belenkey, 1997, as cited in Hockings, 2009).

This was purely qualitative research in which Hockings selected a single student-centered learning activity from the 2003 research as an original case study. This learning activity was carried out by 200 second year degree and diploma students (UK higher education) The new case study focused on the 30% of students for whom the student-centered methods were not effective in an

inquiry based learning project in a business operations management unit. A data base of student information, observations, and audio and video recorded interviews surrounding this learning project was searched (NUD\*IST search tools) for data originally coded and categorized as indicators of surface learning (avoiding, reproducing, focusing on completion, focusing on right answers). These dialogues, interviews, and data were reanalyzed considering sociological and epistemological theory regarding student participation. The author did not describe how her findings were drawn from this analysis, but examples of dialogue that illustrate her conclusions are given.

Hockings concluded that their student-centered environment challenged these unsuccessful students' conceptions of learning, knowledge, ways of knowing, and self. This challenge engaged some students' identities and distanced others. She concludes that all three theoretical perspectives point to the various experiences and conceptions that students brought with them to the learning environment as barriers to engagement. She points out that her lack of sociological and epistemological background information on the students limits her understanding of how student preconceptions and perspectives acted as barriers to academic engagement. She suggests that further research with such background information is necessary and, more generally, that if teachers know their students' epistemological and sociological conceptions, they may be able to design more effective learning environments.

The transferability of this research to my likely classroom setting is limited. The principle reason is that, like many other studies on student-centeredness, it is focused on higher education. Using a population of college students suggests the students are more mature because of age, and that they may possess greater academic capital than students in secondary education. These factors could affect the way students view knowledge, and react to challenges to their personal conceptions. However, the findings are vague and general enough, that there is some value in the cautious transferring of these findings to other student populations--all students have preconceived notions of knowledge and learning.

While Hocking's (2009) findings are vague and general, they are also difficult to confirm. The article does not describe how the student data was reanalyzed. It is difficult to tell how patterns in student's preconceptions were identified or quantified then used to draw conclusions about barriers to engagement in the student centered classroom. This same flaw makes the dependability of the study uncertain. Without a clear notion of the methods used, it is not possible to be certain that her findings are predictable. She gives examples of dialogue that illustrate her findings of student preconceptions as barriers, but it is unknown how her personal bias or expectations may have led to her choice of those particular examples or the patterns she identified.

Even with the described limits to the usefulness of this research, it speaks directly to an important component of my research question that no other study has directly addressed- What are the necessary student dispositions and mindsets for successful engagement in student-centered teaching? Even with limits to confirmability, Hocking's (2009) assertion that students' backgrounds and conceptions can limit their ability to engage, gives some empirical backing to knowledge that seems to be intuitive to many teachers. Examining the effectiveness of structure and autonomy support offered in SCI settings in light of individual students' notions of knowledge and self-identity (mindset) seems like it could yield deeper understanding. To do this, teachers must make a point of assessing their students need for structure. This idea adds another layer to the notion of *knowing students*. Not only is it important to know our students backgrounds to make learning relevant and

inclusive, We may need to know about our students conceptions of the nature of learning and knowledge in order to structure learning opportunities that are accessible to them.

**Summary and implications.** The above studies did not pinpoint exact causes of challenges or barriers to SCI. It is difficult to draw any definitive conclusions from these studies because of the many described limits to applying them to my circumstances. However, this literature review does suggest many entry points for me to explore this further as I develop my practice. The literature showed that fear may play a causal role in the barriers students encounter in student centered instruction. Fear in teachers may stem from their cultural separateness from their students and lead to an inability to really know their students (Burke et al. 2008). Fear in students can stem from their conceptions of the nature of learning as they are confronted with the choice and corresponding personal accountability involved in SCI (Hockings, 2009).

Several of these studies suggest that the level of structure accompanying SCI is a limiting factor to its success. The Furtak & Kunter study (2012) suggests to me that a lack of structure actually causes students to perceive less autonomy than teacher-centered instruction when broad cognitive autonomy is allowed. Brooks & Young (2011) suggest and Patall et al. (2010) corroborate the idea that students feel more motivated by choice in the classroom when it is accompanied by a high level of teacher given support and structure.

While this literature review did not help me pinpoint specific student competencies or mindsets necessary for successful learning through SCI, it does suggest to me that students vary in their ability to be successful in SCI based on their mindset and that the way for teachers to scaffold for this limiting factor is through structure. Because students vary in their need for structure, teachers must know their students' levels of competency in operating autonomously.

As I move forward in my teaching practice, I will investigate students' conceptions of the nature of knowledge and learning (growth vs. fixed mindset). I can do this through conversations, or through more formal surveys and structured assignments. After gaining some knowledge of my students in this way, I can monitor levels of student engagement and learning during SCI under different levels of assignment structure. This may help me understand the necessary competencies and mindsets for students to learn in SCI, and help create a level of structure in classwork that exists in a zone of proximal development for autonomous learning for my particular students. I will also look for confirmation or elaboration of the insights gained through this literature review as I engage literature and professional training surrounding teaching. My understanding of the possible relationships between autonomy-support, mindsets, fear, structure, and choice point to possible areas of new research and will allow me to develop my understanding of barriers and access points to student-centered-instruction through my teaching practice.

## **Principles for Implementation and Applications in Language Arts**

*by Paul Neet*

Having discussed the value of student-centered instruction as well as challenges in the previous sections, we now move toward implementation strategies. Building on the theoretical and conceptual ideas and studies of the previous sections, I aim to explore some practical ideas and best practices for student-centered instruction, with some examples of implementation in specific contexts (particularly language arts).

While I'm drawn to the ideas and principles of student-centered instruction—giving students choices, allowing them to construct their own educational goals and experiences—I didn't put them to much use in my first student teaching placement (I worked with drama and 11 grade language arts classes in a suburban high school). This was in part because I had little practical knowledge of how to best implement student-centered practices. I found that when I tried to give my students choices, they often struggled. For example, as part of a unit on gothic literature, I decided to have students write their own gothic short stories to show their understanding of the genre. While I went in expecting that students would be thrilled to have the freedom to develop stories about anything they wanted, many students seemed to want me to simply tell them what to write about. This pattern repeated several times over the course of my student teaching work: I would offer students choices, some would struggle, and I would try to find ways to modify or scaffold the lessons, with varied success. This disparity between my goals and results led me to focus here on student-centered instruction in general, and on implementation strategies and practices in particular.

I conducted my search for studies mainly using Ebscohost and ERIC. I initially searched for studies using the term *student-centered*, sometimes in conjunction with my particular areas of content focus (*English, language arts, literature*). I noticed that *autonomy support* was a key phrase that many of our readings used, so I included this in some of my later searches.

My readings yielded some broad themes about student-centered instruction. Chief among these were the importance of balancing autonomy with structure, providing holistic educational experiences, and investigating students' backgrounds and perspectives.

**Homework choice.** My intention for this section was to learn about specific practices for student-centered instruction. To that end, I thought that Patall, Cooper, and Wynn's (2010) study of the effects of homework choice would be useful, because it focuses on the effects of choice in a specific pedagogical area (homework). The researchers wanted to determine the effects of homework choice on motivation and academic performance.

This was a quantitative study, with experiment and survey elements. For the experiment, the researchers used a post-test only control group design. Several hundred high school students were randomly assigned to a group that had homework choice and a group that did not. Their performance was analyzed, they took a motivation survey, and then the groups were switched and the experiment was performed again.

Results indicated that homework choice strongly coincided with interest, enjoyment, perceived competence, and high test scores, and somewhat less strongly coincided with homework completion. Results also suggested that if teachers give students choice, the students will be more likely to report that teachers engage in other autonomy-supportive practices, such as providing rationales and listening to, encouraging, and understanding students. In other words, if teachers provide autonomy support in the form of choice, students will perceive that they are providing other kinds of autonomy support, as well. This reinforces previously-mentioned indications (Lepper et. al., 2005; Vansteenkiste et. al., 2004) that student perception of autonomy support may be as important as the actual support itself.

One potentially limiting factor for generalizability of this study is that the sample size was fairly small (207 students from two schools, which were in the same general area). I would feel more confident about generalizability if the sample were broader and more diverse.

The post-test-only control group design model controls for many of the variables that could impact internal validity. Because the groups switched and then repeated the procedures, the study was

essentially performed twice. Also, the researchers were careful to instruct students not to discuss their homework, so contamination between groups should have been fairly well-controlled.

The researchers point out that there were some student absences over the course of the study, and students who were absent on important days were excluded from the results. The researchers point out that students who are absent a lot tend to be more likely to also struggle academically. This could mean that struggling students were inordinately removed from the study, which could have skewed the results.

While the researchers describe many benefits of choice, they point out that in past studies, some results have been inconsistent. They suggest that there have been some observed cultural differences vis-à-vis choice (i.e., in certain cultural contexts, student choice may be viewed as detrimental).

**The effects of open play.** One of the key elements of student-centered instruction is for students to have a high degree of autonomy and control over their own learning. This can raise questions about the function of the teacher: if student-centered instruction is largely about allowing students to explore and learn in a self-directed way, then what is the proper role of the teacher? Podolefsky, Rehn, and Perkins' (2013) study of the use of "open play" might provide a useful model for answering this question.

In this study, the researchers sought to find out how open play time at the beginning of a lesson affects student agency. They conducted a quantitative study that used a pre-experimental design. In two pre-existing fifth-grade classes, students participated in the same lesson, which involved a scientific simulation program on computers. In the experimental group, the lesson started with time for students to play with the program on their own prior to instruction from the teacher. In the control group, the lesson began with instruction.

In the experimental group, the teacher used more "student-centered utterances" during instruction time (Podolefsky et al., 2013, p. 309), while in the control group, the teacher provided more direct instruction. The researchers concluded that play time "appears to familiarize students with a sense of autonomy" (2013, p. 309), increases intrinsic motivation, and allows teachers to spend more of their time on content-area ideas than on questions about how to use the program.

This study was a static group comparison. Between the normal internal validity threats to this type of study (selection being the main one in this case, since the groups were pre-existing and thus not randomly selected) and the very small sample size and length of study (only a single lesson), it is difficult to draw firm conclusions from the results. For example, while the results suggest that the lesson was more student-centered for the experimental group, it cannot be firmly established that this result was caused by the play time. One teacher might simply have been more predisposed to student-centered practices than the other, or the difference could be attributable to differences in the makeup, skill levels, or attitudes / interests of the students themselves. With only two teachers and two classes, there isn't enough data to minimize these variables. Also, while the researchers' aim was to analyze the effects of play in general, their actual research was focused on a particular kind of play: manipulating / experimenting with a computer program. Results from this kind of play may or may not be applicable to other kinds of play.

For these reasons, I do not think that I can consider the results of this experiment as anything beyond anecdotal. Still, in light of other studies, this anecdotal evidence does reinforce some of the points I have come across elsewhere. The researchers mention that students had expressed that they enjoyed both having time to play freely with the simulations and the guided instruction that followed.

They suggest that the former allows students to develop a sense of autonomy and ownership over their learning, while the latter helps them to refine their thinking and focus on specific learning objectives. This connects to one of the dominant, overarching themes of these studies: student-centered instruction does not simply mean complete freedom for students; rather, it seems to work best within a context that mixes freedom for the students (in this case, the free play time) with structure provided by the teacher (in this case, direct instruction).

If teachers are to make instruction student-centered, then they need to know as much as they can about their students—their views, their needs, their backgrounds. To provide examples of what this process might look like, I looked for studies that highlighted students' own voices with regard to student-centered instruction—in other words, studies about student-centered instruction that were, themselves, designed in a student-centered way.

**Cultural factors and student perceptions of student-centeredness.** Guiffrida (2004) conducted a study about students' own understandings of what makes instructors student-centered. He focused on the attitudes of African American students at a predominantly white institution of higher learning. Previous studies had indicated that African American students at these institutions tended to not find interactions with white faculty as rewarding as interactions with African American faculty. Therefore, the researcher thought it would be valuable to find out from African American students themselves what qualities they valued and found helpful in African American faculty.

This was a qualitative study, based on interviews with students. Guiffrida used purposeful sampling, soliciting students with flyers on campus to find African American students who were academically successful and had positive experiences with faculty. He conducted detailed interviews with 19 undergraduate students, including both focus group and solo interviews.

In the interviews, many students focused on the quality of faculty “going above and beyond” (2004, p. 708)—providing career, academic, and personal guidance; advocating on the students' behalf; communicating with family; providing extra help and tutoring; continually monitoring their progress; and holding high expectations. Many students spoke of African American faculty “raising the bar” (2004, p. 712)—emphasizing that they must perform especially well to be viewed equally with white students, and holding them to especially high standards. While some students appreciated this and found it motivating, others felt it was unfair. From this information, the researcher notes some possible gender differences in what is and isn't motivating, and emphasizes that teachers need to be aware of what styles of motivation are effective for particular students.

These points are valuable both as insights into patterns of what some African American students want from their teachers and as examples of the kinds of information that teachers who want to practice student-centered instruction should seek out about their own students. Student-centered instruction requires teachers to make themselves aware of the cultural and social context of students' needs. In this case, for example, these African American students' conceptions of student-centeredness were connected to a concept drawn from the African American community called *othermothering*, which involves a more holistic student-teacher relationship than is common among white faculty. Traditionally, other-mothers were “women who assist[ed] blood-mothers by sharing mothering responsibilities” (p. 715), and this concept was often applied to teachers in the African American community, particularly in the era of racially segregated schools. In this model, teachers are not just instructors, but are “frequently considered important members of students' extended families” (p. 716). Guiffrida suggests that this concept may have filtered down to the present and led

to a greater tendency among some African American students and families to expect teachers to attend to students' emotional and cultural needs in addition to academic needs.

This was a grounded theory study. For one thing, this means that the researcher went in without a particular theory or focus, and allowed the focus to evolve over the course of interviews and discussions. Since the researcher aimed at going into great detail with a small number of students, any conclusions are more about observed patterns and individual snapshots than broad data or firm conclusions.

I think that these findings are somewhat transferable to my context. The researcher worked with a small sample—a handful of students at a single institution—but I think this is enough for pointing out a few patterns and important points in some students' sense of student-centeredness. A significant limiter of transferability is that this study focused on college students, and I will be working with high school students. There are likely some significant differences in the needs of high school and college students. For example, college students are often adjusting to being away from family and experiencing significantly increased independence, while most high school students are still living with family. These and other factors might affect what students need or expect from their teachers.

It seems to me that this study was conducted and covered with a high degree of credibility and confirmability. The researcher conducted interviews in several different ways (small group and individual), checked for negative case data, and engaged in member checking and peer debriefs. Also, he openly acknowledged how his positionality (his whiteness being the most significant factor in this case) may have affected students' level of openness, limitations of his study, and needed next steps.

This study emphasized the importance of considering students' culture in student-centered instruction. This goes beyond representing different cultures in images and content—as with the other-mothering concept, teachers can and should actually incorporate students' cultural values into their own educational philosophy. This is a holistic view that emphasizes the importance of treating students as whole people, as well as recommending some particular practices (providing professional contacts; tutoring; academic, career, and personal advice). There's also an important challenge here: as the researcher points out, the idea of discussions or advice with students going beyond the strictly academic would strike many as crossing professional boundaries. These are difficult waters to navigate, and they point to one of the many ways in which the emergence of student-centered instruction can face institutional and individual resistance.

**Applying student-centered instruction in the language arts classroom.** In addition to studies that would provide models of how to make student-centered instruction work for particular groups of students, I wanted to find studies that would provide models of how to make student-centered instruction work within particular content areas. Since language arts is the content area that I am most familiar with, I selected two studies that deal with the application of student-centered instruction in the secondary language arts classroom.

Ivey and Broaddus' study (2001), like Guiffreda's, was conducted in a student-centered way, with an emphasis on student perspectives. Having noticed that many middle school students show a lack of interest in reading in the classroom, Ivey and Broaddus suspected that students were turned off of reading by nonresponsive curricula and institutionalized structures that “may foster both negative attitudes and school failure” (2001, p. 353). The main purpose of the study was to identify features and practices of reading instruction at the middle school level that foster student engagement and motivation.

Their study was primarily quantitative, as most of its data came from survey responses. (However, since survey responses were supplemented by some follow-up interviews, it also included some qualitative elements.) The researchers surveyed 1,765 sixth-grade students and conducted some follow-up interviews with individual students.

The reading activities that students reported most preferring, by a wide margin, were free or individual reading time and teacher read-alouds. Students appeared to be far less interested in whole-class or group reading activities. Students reported enjoying free reading because they could choose what to read and work independently and at their own pace. This reflects the importance of individual choice, which is one of the central components of student-centered instruction.

The range and diversity of materials that students reported reading on their own seemed to generally be much wider than readings that students were assigned. This is an especially relevant point for student-centered instruction: one of the common arguments against giving students broad choices in what to read in school is that they may focus exclusively on a particular niche interest (comic books, fantasy novels, etc.) at the expense of well-balanced reading. However, the results of the study suggest that when students are given choice, they tend to follow many different interests and read many kinds of materials.

Generalizability seems fairly strong for this study—the researchers sought responses from different regions and from diverse groups of students. However, the researchers mentioned some relevant potential limitations. While they received survey responses from a wide range of students and regions, they were limited to those within that range who chose to participate, which might have skewed the samples. Also, while students were assured that their survey responses were anonymous, the surveys were administered and collected by teachers, a factor which could have made some students choose to be less than completely candid. The researchers received responses from many students in different regions and settings, and it seems that there was not significant, major variation in trends in responses. This suggests that the general findings are likely to be broadly applicable in different settings.

It is interesting that students seemed to widely prefer solo choice reading and tended to dislike group or whole class work. While this might suggest a general lack of interest in whole class / small-group reading work or discussions, the researchers mention that other studies have indicated high student engagement in book discussions in less formal settings. Perhaps the problem is that classroom book discussions tend to be too “academic” and not focused on personal connections or responses. There’s a possible connection here to Guiffreda’s study (2004), which suggested that many students (particularly African American students) desire more personal, holistic interactions and discussions. There may be a need to make in-school discussion of texts a little more like out-of-school discussions.

While students valued free reading time, they often weren’t sure about how it fit in with daily reading instruction. This connects to one of the broad points that has come up in many of the studies we’ve read (Brooks & Young 2005; Hockings 2009; Podolefsky et al., 2013), which is that freedom needs to be connected to structure. It seems that typically, students have a lot of freedom in their free reading time, but little or no guiding structure, while in assigned reading, they have lots of structure but little freedom. Perhaps we need to find ways to build bridges between the two.

Wiseman’s study (2011) is also focused on student-centered instruction in English Language Arts. Wiseman felt that literacy curricula are often narrow, focused inordinately on tests and test preparation, and disconnected from students’ experiences and from how they “use literacy in their own lives” (2011, p. 70), leading to the same sort of disengagement and disinterest that Ivey and

Broaddus describe. Wiseman describes a poetry workshop that is presented as a potential model for literary instruction that engages students by focusing on their own experiences, feelings, and understandings.

This was a qualitative, ethnographic case study. Wiseman observed a single grade 8 English class over the course of a year. She observed lessons and conducted focus group sessions, solo interviews, and informal discussions with students.

The workshop encouraged students to contribute to their learning context and engage critically with ideas that were relevant to their lives. This helped in bridging the disconnect between students' learning and experience at home and at school. By keeping the lessons focused on students' experiences and interests, teachers were theoretically able to significantly tap into students' funds of knowledge and prior learning.

Each lesson started with a poem or song that dealt with a particular theme. Students were given the option of using this theme as a springboard for their own writing, or to write about something else. This is a solid, specific example of giving students regular, authentic choices. Students were given time near the end of each workshop to share their work, read aloud, and give feedback. This means that students were always writing for an authentic audience (each other). Since feedback came from other students, instead of from a teacher, the assessment of student work was student-centered. Students were generally much more engaged with analysis of poetic conventions when they were discussed in the context of their own writing (as opposed to published poetry).

It is difficult to say whether I can transfer the results. Wiseman provides plenty of thick description, and the class she observed was fairly different from the kind of settings I'll be working in: she conducted her research in an urban, low-SES, predominantly African American setting; while I'll be in a mostly white class in a suburban setting. If there were notable differences between how African American and white students (or urban and suburban students, or students who come from different economic backgrounds) engage with poetry workshops, this study would presumably not have discovered them, since it was only conducted in a single setting. Still, Wiseman's study does provide some valuable examples of student-centered instruction in practice.

Wiseman used several practices to ensure credibility. She provides detailed contextual information and engaged in different kinds of data collection, including classroom observations, focus groups, and individual interviews. She observed for an extended period (a full school year), and she engaged in member checks with students and teachers as she built understandings and conclusions.

This study gives valuable examples of specific practices for student-centered instruction. For example, beginning poetry lessons with hip-hop lyrics and other works that students are familiar with is a concrete example of connecting content area knowledge with students' individual interests, prior learning, and funds of knowledge.

Students' work was open-ended, in that they could choose to write about whatever they wanted, move about the room, and give each other feedback, but there was also structure provided by the example poems and the themes they suggested, and specific criteria to guide feedback. This is an example of structure being used along with autonomy support.

Many of the students mentioned that they appreciated the chance to deal with their emotions and feelings. This ties into Guiffrida's findings: it seems that many students desire holistic classroom experiences that acknowledge and take into account their personal and emotional needs, as well as academic concerns. For example, one student said that the poetry workshops helped "emotionally and

therefore academically” (Wiseman, 2011, p. 74) – this suggests a connection between emotions and academics that isn’t often acknowledged in traditional, teacher-centered instruction.

**Summary and next steps.** Several common themes about the implementation of student-centered instruction emerged from my readings. First, and perhaps most importantly, several of these studies suggest that while student-centered instruction requires teachers to afford their students some degree of choice, freedom, exploration, and play, this must be combined with structure and guidance from the instructor. Second, it seems clear that many students desire holistic instruction that acknowledges and allows them to deal with and incorporate their emotions, backgrounds, and outside-of-school lives. Third, student-centered instruction requires teachers to investigate and consider their students’ cultural backgrounds and views, especially with regard to what student-centered instruction means and looks like to them. In other words, the methods teachers use to shape their student-centered plans and curriculum should, themselves, be student-centered. This might take the form of student interviews, surveys, or focus group discussions aimed at drawing out and defining the needs of individuals and groups within the classroom.

This research points to some important areas for further exploration. In general, while these studies make it clear that there should be a balance between autonomy and structure, and they provide some examples, they don’t tell me much about how to achieve this balance (how they best support each other, how they should be mixed). An important next step would be to look for studies that deal more specifically with the interrelationship between autonomy and structure.

Several studies (Patall et al., 2010; Guiffrida, 2004) suggest possible cultural and/or gender differences in students’ perceptions and needs with regard to student-centered instruction. Podolefsky, Rehn, and Perkins (2013) makes some general points about the value of play, but does not provide as much information as I would like to have about implementation strategies. Ivey and Broaddus (2001) indicate the value of more individualized, choice-centered reading curricula. In all of these areas, I would like to learn more about how to best implement these practices, and how they might be used in different content areas. I will look for more specific case studies and information about tested practices in these areas, as well as exploring them in my own teaching.

## **Conclusions and Key Insights**

By engaging this study, we have sought to gain knowledge of the benefits and challenges of student-centered instruction and best methods for its successful implementation. To this end, we began our investigation by exploring literature about the values and purpose of SCI. These studies showed positive correlations between SCI and student engagement and motivation. There were conflicting results in regard to the need for consistency in classroom policy. Next, we reviewed literature to explore possible barriers to and necessary conditions for SCI. This research did not pinpoint exact barriers or conditions, but showed that fear, the level of teacher-provided structure, and conceptions of knowledge and learning all may play a role and serve as entry points for further research. The last literature review focused on successful implementation strategies. While this did not yield specific proven methods, it did show that a balance between structure and freedom of choice may be important and that holistic strategies—those that incorporate emotions and background—may be the most successful.

Through this review of literature surrounding student-centered instruction, it has become clear that while there are positive correlations between autonomy support, motivation, and engagement, the positive impact of choice (a key component of our definition of SCI) seems to hinge largely on the presence of teacher-given structure in instructional activities and expectations. The experiments that seemed most successful in supporting student learning through SCI had high levels of instructional structure (consistency is an area of conflict) supporting limited choices in learning activities communicated through autonomy-supportive language. This importance of structure in supporting the autonomous construction of knowledge was a central insight to some members of this research group who had previously thought of high levels of structure as corresponding to teacher-centered instruction. In fact, several studies (Burke et al., 2008; Furtak & Kunter, 2012) indicated that the educators who carried out these studies also held this assumption and were surprised by the important positive role of structure in SCI.

There is also evidence that the usefulness of choice is influenced by students' epistemological mindset and past experiences in education. It may prove useful to explore these insights in light of new research in neuroscience concerning the way the brain receives and processes information. How do students' mindsets affect their ability to make new neural connections, and how might fear play a role in this?

Another important insight was that intrinsic and extrinsic motivation are not mutually exclusive, and both have benefits. It appears that as students get older, intrinsic motivation decreases because older students lose their social desirability need (Lepper et al., 2005). This may signal the need for teachers to provide autonomy support to scaffold independent learning, particularly past the elementary level. Throughout the research, language describing SCI continually focused on students' perceptions of choice. Autonomy support is largely about perceptions of choice (Patall et al., 2010) and empowerment is accomplished through non-controlling language that supports these perceptions for students. Several studies showed that perceptions of choice were even more important than actual choice in supporting student growth (Lepper et al., 2005; Patall et al., 2010; Vansteenkiste et al., 2004).

A final important insight was that students already engage ideas and construct knowledge in environments where they feel safe and can engage their interests. Building bridges between these environments (where students are already autonomous learners) and the classroom environment could bring great success to academic learning. This will require teachers to know their students' interests and passions outside the classroom and somehow incorporate them into classroom learning. Thought of in this way, planning for student-centered instruction needs to itself be student-centered.

As new teachers launching our careers, we find these insights into student-centered instruction to be extremely valuable. They point the way to further professional inquiry for developing our knowledge of student-centered teaching. This is important knowledge for modern teachers to have in an economy that is becoming increasingly dependent on people who are autonomous thinkers and learners. The importance of these learning skills is reflected in the newest professional literature and public education policy, such as the Common Core State Standards and Next Generation Science Standards. By actively pursuing knowledge of and competence in student-centered instruction, we are empowering ourselves as teachers and potential leaders in our professional community.

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Appendix

Research Question	Findings (i)summary (ii)significant	Design (i)qual/ quant (ii)type of study	Strengths and weaknesses	Sample	Definition & strategies for measuring important outcome variables	Treatment	APA Citation
What are the effects of homework choice on motivation and academic performance?	--Homework choice strongly coincided with interest, perceived competence, test scores. --Perception of choice = perception of other autonomy-supportive practices.	Quantitative. Experiment (post-test only control group design), survey.	-Fairly small sample (2 schools). -Conducted by preservice teachers. +Design controls many variables that affect internal validity. +Performed twice.	207 high school students in 2 schools.	--	Homework choice.	Patall, et al., 2010
How does "open play" time at the beginning of a lesson affect student agency?	--More "student-centered utterances" from teacher in experimental group. --Students valued mix of play (autonomy) and direct instruction (structure).	Quantitative. Pre-experiment (static group comparison).	-Validity threats: esp. selection. -Small sample, short study. -Context different from mine. -Only measured one kind of play.	2 fifth-grade classrooms at a single school.	--	Free play time with instructional materials (computer program) before instruction.	Podolefsky, et al., 2013
What teacher characteristics facilitate meaningful relationships with African American students?	--Tended to find African American teachers more student-centered.  --Valued teachers "going above and beyond."  --Importance of cultural context, holistic view of students.	Qualitative. Grounded theory.	-Small sample +Great detail -College students +Different interview methods +Checked for negative case data +Member checks +Peer debriefs	19 African American undergrad students at a predominantly white college	--	--	Guiffida, 2004

Research Question	Findings (i)summary (ii)significant	Design (i)qual/quant (ii)type of study	Strengths and weaknesses	Sample	Definition & strategies for measuring important outcome variables	Treatment	APA Citation
What features of middle school reading instruction foster student engagement?	--Choice aligned with positive experience. --Great range of solo reading materials. --Importance of personal relevance.	Primarily quantitative  Surveys, interviews.	+Large sample (different regions, diverse). -Limited to those who chose to respond. -Surveys administered / collected by teachers.	1,765 sixth graders.	--	--	Ivey & Broaddus, 2001
How do students participate in a classroom poetry workshop led by a community member that builds on their experiences and knowledge in various contexts?	--Importance of focusing on students' experiences, identities. --Mix of structure and autonomy.	Qualitative. Ethnographic case study.	-Significantly different setting from my own +Thick description +Different methods of data collection -Single setting +Long period of time	Single 8 <sup>th</sup> -grade class.	--	--	Wiseman, 2011
What are the personal and institutional barriers to implementing student centered curriculum?	Institutional barriers stem from policy imposed from outside. Personal barriers stem from cultural separateness and fear.	Qualitative. Convenience case studies.	-Small sample  -Lack of description of population and methods.  +Directly addresses barriers to CSI.	5 teachers and their students in a single school.	--	--	Burke, et al., 2008
What is the impact of student choice on motivation and empowerment.	Students only felt empowered when there was consistency in the level of choice given between attendance policies and homework.	Quantitative. Survey.	+Large randomized sample.  +Detailed description easily confirmable.  -Does not generalize to secondary students.	419 students in a single U.S. college.	Survey responses analyzed by the SIMS motivation scale.	Level of choice in homework and attendance policy.	Brooks & Young, 2011

Research Question	Findings (i)summary (ii)significant	Design (i)qual/ quant (ii)type of study	Strengths and weaknesses	Sample	Definition & strategies for measuring important outcome variables	Treatment	APA Citation
What are the effects of procedural and cognitive autonomy support on learning and motivation.	High levels of cognitive autonomy support were associated with perceptions of less choice and more controlling behavior.	Quantitative. Experiment.	+Strong internal validity-stratified random sampling.  -Limited generalizability - culturally unique population.	51 7 <sup>th</sup> grade students from a single English speaking school in Germany.	Two instruments for measuring variables- a pre/post-test and a questionnaire analyzed for perceptions.	4 treatment conditions-all possible combinations of high and low procedural and cognitive autonomy support.	Furtak & Kunter, 2012
How can sociological, epistemological, and approaches to learning frameworks explain why SCI is ineffective for some students.	All three perspectives suggest that background experiences and conceptions were barriers to learning for unsuccessful students.	Qualitative. Case Study.	+Directly addresses student barriers to SCI.  -Lack of description of analysis weakens confirmability.	60 college students in the UK.	Recorded dialogues and interviews were analyzed considering epistemological, sociological, approaches to learning theoretical frameworks.	--	Hockings , 2009
To identify the effectiveness of intrinsic motivation and autonomy-supportive environments	Autonomy-supportive language coupled with intrinsic language leads to the highest levels of motivation. All results appear to be significant with many very significant at $P < .01$ .	Quantitative experiment conducted 3 times.	biggest threat to internal validity is experimental treatment diffusion.	Study 1: 200 female Belgian Pre-service pre-school students Study 2: 181 Male and 196 female Belgian marketing students Study 3: 111 female and 113 male high school students in physical education class	Intrinsic: relating to relationships, community and health. Extrinsic: fame, wealth, image.	four different set of instructions . four different paradigms: intrinsic goal conditions, extrinsic goal conditions, autonomy-supportive conditions, and controlling conditions.	Vansteenkiste, et al., 2004
What is the relationship between intrinsic and extrinsic motivation?	Intrinsic & extrinsic motivation separate but related constructs student's need to feel socially desirable decreases as student's grow older.	Quantitative. survey	statistical regression - researchers do not report student's test levels or achievement levels.	797 third-through eighth-grade students	Social desirability: the student's need for approval or fear of disapproval in their responses.	Survey without changing any existing conditions.	Lepper, et al., 2005

<b>Research Question</b>	<b>Findings (i)summary (ii)significant</b>	<b>Design (i)qual/quant (ii)type of study</b>	<b>Strengths and weaknesses</b>	<b>Sample</b>	<b>Definition &amp; strategies for measuring important outcome variables</b>	<b>Treatment</b>	<b>APA Citation</b>
Looking at 3 different teachers classrooms to see how the student centered pedagogy matches up with their classroom management procedures	student versus teacher centric is reflective of the teacher's own preferences and personality.	Qualitative. Case study.	No significant limit to transferability – the setting is very specific.	Three teachers in a suburban K-6 science and technology magnet serving 615 students.	some classroom management techniques are not classified as either student or teacher centered (proximity, verbal commands, "the stare").	Conduct pre- and post-observation surveys and tape recorded interviews. Observe classrooms and record findings.	Garrett, 2008.
What are the effects of student-centered instruction on student engagement?	the link between content and pedagogical knowledge.	Quantitative. Experiment.		40 teachers and their classrooms.		provide instruction to two cohorts of 40 teachers for 3 years to improve their content and pedagogical knowledge.	Gningue, et al., 2013.

# What are the Effects of Democratic Classrooms? An Exploration of Research

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*Christopher Patwardhan Foes, Kelly Shaffstall, Andrea Thompson-Benton, and Christy Turnbow*

Our investigation focused on whether teaching practices through student-teacher collaboration and student decision making affect educational outcomes. We focused on the following areas in our literature review: (a) effectiveness of democratic classroom strategies; (b) classroom management; (c) student knowledge gain; (d) student course completion; (e) teacher burnout; and (f) academic rigor and long-term planning in a democratic classroom. Our guiding research question was: what are the effects of democratic classrooms? We chose to explore this topic because student-centered education is becoming increasingly common in the United States' education system, and democratic learning was a shared interest for our teaching practices. Our investigation used the research databases EBSCOhost, ScienceDirect, JSTOR, ERIC, and Google Scholar. The concepts we searched for were student-centered learning, learner-directed education, and democratic classrooms. We found choice and collaboration among students reflected many positive outcomes for students and teachers, with the exception of student knowledge gain. When students were included in choice and collaboration in regards to rules, curriculum and processes, it was shown to have a positive effect on student engagement. Student-centered learning also increased student course completion and reduced teacher burnout. Our research findings imply that we should focus on being strong facilitators if we chose to employ student-directed learning in our classrooms. We plan to employ democratic strategies and refine our instructional practices using classroom evidence. To further our research, we will investigate the impact of different styles of democratic practices as well as what features affect student disaffection.

**Keywords:** *democratic education, elementary classroom management, student-centered, student-directed and self-efficacy.*

To maximize student achievement, we investigated the philosophy of student-centered learning in democratic classrooms. Our focus was on the effectiveness of democratic learning strategies in an educational setting. We investigated whether teaching practices through student-teacher collaboration and student decision making affect student achievement. An aspect of our research was to understand the implications of rigor and planning in a student-directed classroom. Another focus was whether a democratic approach also serves as an effective classroom management strategy. Lastly, we explored the effect of student-centered and more specifically student-directed strategies on student and teacher disaffection.

Effectiveness is the extent to which an activity fulfills its intended purpose or function (Harvey, 2014). We understand democratic education to be defined as one that brings democratic

values (such as justice, respect and trust) to education and utilizes democratic participation (IDEA, 2014). Student achievement is defined as the measurements of students' knowledge through assessments, state or otherwise (Department of Education, 2012). Student-centered learning directly relates to democratic education by allowing the educational focus to follow the interests of students, rather than teachers and administrators (Jones, 2007). Student-directed learning connects democratic education and student-centered practices by allowing students to direct their own learning. Self-directed learning includes allowing students to make decisions in all aspects of their education from content, process and classroom management (Jones, 2007). Self-efficacy is a person's ability to self-assess and determine if they are able to do a given task and is shaped through social interactions. Self-efficacy is important in the learning process as it allows the individual to reflect and decide where they need more support (Davis, 2010).

As the school environment begins to shift more towards collaborative models, it becomes important to research the possible positive and negative effects that these models will have in the classroom (Cook-Sather, 2002). Because the student-centered learning philosophy is rising in popularity, and as a democratic classroom is a common implementation of the philosophy, the exploration of how it is implemented and its effects on student learning must be closely inspected (Cook-Sather, 2002). As the public school system focuses on creating a culture of thinkers, fostering engagement and interest, and narrowing the achievement gap, we can weigh the research in the area of democratic classrooms to see if the research will meet the needs of our new generation.

Some researchers have disagreed that democratic strategies lead to improved classroom outcomes. Raywid (1976) argued that the philosophy of democracy in the classroom was based solely on ideology and is unfeasible. Another concern brought by the learning community in regards to a student-directed education is the inability of students to make their own long term educational goals. Learning theorists Bransford, Brown, and Cocking's of *How People Learn* explain that, "Experts have acquired a great deal of content knowledge that is organized in ways that reflect a deep understanding of their subject matter...Novices' knowledge [in contrast] is much less likely to be organized around big ideas; they are more likely to approach problems by searching for correct formulas and pat answers that fit their everyday intuitions" (2000, p. 31 & 49). This does not discredit a democratic classroom, it simply means that teachers are key as facilitators for providing rich content knowledge and context for understanding while guided by a main idea. In fact even, *How People Learn*, does not take their findings as an endorsement of teacher-directed learning because they state that, "In fact, expertise can sometimes hurt teaching because many experts forget what is easy and what is difficult for students" (Bransford et al., 2000, p. 44).

Educational theorists have highlighted the importance of strong inter-student interactions and its role in student learning. Vygotsky, an influential russian theorist, as cited in Kozulin et al. (2003), has discussed the importance of collaboration in creating learning opportunities through a process he described as the Zone of Proximal Development. Neuroscientist Zull (2002) explains the necessity to test out ideas and information to solidify new knowledge. Teachers are important facilitators in the learning process by allowing for time to test out student hypotheses. Polletta (2002) expands on this concept, stating that, "Giving people a stake in the decision gives them a stake in the success of the action and in the survival of the group...Decentralized and informational organizational structures can generate innovative tactics by encouraging group input" (p. 2&7). In fact, Dewey (1937) claims that, "It is a fair estimate that the absence of democratic methods is the greatest single cause of

educational waste” (p. 224). We focus on democratic classrooms because the philosophies of these theorists have demonstrated its importance.

**Purposes and strategies in setting-up a democratic classroom.** We want to improve our teaching practice through student-teacher collaboration and decision making to integrate students into a classroom community. Research suggests, student lead democratic classrooms provide authentic learning opportunities that students play a part in developing through having a voice in decision making and choices. When students have an active participatory role in their learning process, they become vested in their own learning. In a student lead, student-centered democratic classroom, students are given the power and responsibility. These classrooms rely on teacher guidance, to create, engage, interact, problem solve and develop critical thinking skills. The roles students have in a democratic, collaborative classroom prepare them for similar responsibilities they will have in society (Dewey, 1916). Research indicates that having strategies in place are the necessary tools to activate a student-centered democratic classroom. Research reveals it is important for teachers to empower students to challenge themselves in learning. Teacher strategies that have been found to be effective are: (a) the use of critical thinking questions; (b) elevating of student status culturally, academically and socially; (c) use of community meetings; and (d) developing an inclusive environment that provides equal access to learning opportunities for all students. In particular, students needing accommodations, through teacher designed tiered tasks and assessment, are supported and benefit from effective strategies used in a student-directed, student-centered democratic classroom. Research studies indicate when students are involved in the decision making process, they become eager learners and valued members of the learning community that they are in; they become active learners and stakeholders in their future.

**Democratic education as a way to deepen understanding of content.** We are writing about autonomy, self-directed learning, and democratic classrooms because we see that creating a democratic classroom is important to our practice as well as the educational community as a whole. This is because it increases students’ academic achievement and leads to deeper understanding of content. People are more interested in working and understanding something when they have a say in what it is and therefore see purpose in its creation and outcome.

People are motivated into action by three drives: autonomy, mastery, and purpose. Public schools can generally work on the mastery aspect; there are ways to improve the way a subject is structured incrementally and with metacognition in public education this will be touched on but the other two drives are more crucial. Students often have very little say over the course of their education on any substantial level and therefore are motivated to see little purpose in it. Creating autonomy, self-directed education, democracy in the classroom is important to our practice because as educators we want students to see purpose in their learning. Students will be motivated to learn when it is what they want to learn that is being addressed. Students will see purpose in their learning if they choose what they are studying.

Teachers also have a motivation for student-directed classrooms. If you want to create a democratic citizenry it is only expected that we work to developed lifelong learners. We must teach our capacity to learn. Doing this means allowing students to have self-direction in their education.

Students seem to be much more disconnected from their education. Through our research, we hope to find ways that students will be much more active participants in the education. We feel that being in a democratic society, we can use these same values to instill active participation in the

classroom. We believe encouraging students to be more active in their education, it will lead to a narrowing of the achievement gap.

**Democratic classrooms and classroom management.** Our investigation explored whether a student-centered teaching approach, where the students are active participants in the classroom, engaged the students in the work differently than a traditional classroom. This investigation also focused on whether students took more responsibility for issues that came up in the classroom by examining whether students are more likely to be enforcers of the rules when issues do come up in classrooms when they had a better understanding of rules.

Having a democratic classroom may contribute to having better, more self-sustained classroom management. When students are actively engaged in making the rules through voting, and delegating classroom jobs, they may be more likely to follow them. The extra time spent with the students coming up with the rules themselves may save time solving classroom management issues (Thornberg, 2007).

When the students are able to make the rules through debate and dialogue, they may be more likely to remember the rules and follow those rules. This is because they have the opportunity to explore the rules leading to a better understanding. This may also lead to students being more likely to be enforcers of those rules when problems do arise. With students feeling more responsible and that they have a voice in the classroom, they could take a more active role in learning. When they are able to make decisions and feel their views are respected and heard as much as their classmates, their engagement and interest levels may rise (Thornberg, 2007).

**Student-centered learning and disaffection.** The critics and proponents of student-directed classrooms, and student centered learning overall, are often focused simply on its efficacy in relation to student knowledge gain. However we are interested in discovering if student centered learning strategies can reduce the disaffection of students and teachers in the classroom. New teachers experience high levels of burnout, and the teaching profession has a high rate of turnover in general. This issue affects students in that they are often taught by new, inexperienced teachers or teachers who do not feel connected and empowered by their work, and therefore may do a substandard job. Also, Certain student populations have been underserved by the public education system in the United States; Washington State is no different.

In this section of the literature review, Chris Patwardhan Foes explores whether there is a relationship of student centered learning, of which student-directed learning is a subcategory, and disaffection as defined by burnout within teachers and dropout within students. He discusses the efficacy of student-directed learning in knowledge gain, and looks at the factors of teacher burnout. Lastly he looks at student's attitudes towards teacher-direct and student-directed learning.

## **Strategies Used to Set-up a Democratic Classroom**

*by Andrea Thompson-Benton*

My question focused on exploring the effectiveness of concepts and strategies used to set up *democratic classrooms* to build classroom community learning. I used Ebscohost, JSTOR, and google scholar to look for research studies using the terms *democratic classrooms*, *student shared decision making*, *student lead*, *student-centered*, *student teacher collaboration*, *democratic classroom strategies* and *student participation*. In my limited search I found few research studies that directly

answered my question. I read several articles from experts that presented strategies used in democratic classrooms to guide my research. The types of research studies I reviewed ranged from teachers' opinions on building democratic classrooms to how democracy in the classroom empowers students. From the few research studies I found available on democratic, student-directed classrooms, I was provided with conceptual understandings important to my question. While other studies provided concrete findings that helped me paint a broad picture of what it takes to build a democratic classroom. The studies that seemed to provide evidence of more concrete findings encompassed roles of student and teacher, the benefits of student shared decision making and the effects on student achievement, all of which were relevant themes to my question.

I defined the democratic classroom as an educational setting where students play an active role in planning their learning and daily operations. My definition of student shared decision making is where student input is used as the activity necessary to create a democratic classroom. Student participation is defined as the opportunities provided for students to share in decision making. These three main terms when combined appear to be the processes that make a democratic classroom: (a) giving students a voice in planning how and what they learn; (b) what rules are required to function as a community of learners; and (c) what students are responsible for when creating strategies for classroom community learning.

**Teachers' opinions about building a democratic classroom.** Kesici (2008) examined "how to build a democratic classroom in terms of teacher's views" (p. 192). The qualitative research method was used in this case study. Fifty teachers were purposefully sampled and selected based on the criterion of practicing democratic discipline in the classroom. The purpose of the study was to find out from teachers what was needed to build a democratic student-directed, student-centered classroom. Teachers were interviewed using a semi-structured interview technique combined with literature reviews to examine how to build a democratic classroom from a teacher's point of view. The study was applicable in directly addressing purposes and foundations necessary in setting up a democratic student lead classroom in particular because the emerging themes were views of practicing democratic teachers. The overarching emerging theme the study found was that the determining factor for setting up democratic student-directed classrooms was that the teacher must have democratic values which are based on democratic beliefs.

Kesici (2008) designed a case study with a qualitative approach to gain a deeper knowledge of what teachers do to build a democratic classroom. The study developed a set of six questions that would fulfill the purpose of the research. Purposeful sampling was used to locate the 50 teachers that were selected using specific criteria. The criteria used for teacher selection was teachers using democratic discipline in their classrooms. Each teacher was interviewed one-on-one for 45 minutes and each teacher was individually coded to assure anonymity. Semi-structured interview techniques were used to collect data. The semi-structured data collection technique was reviewed and tested for validity by five instructors with their doctoral degrees in educational science. The opinions and comments of the five instructors were implemented in the semi-structured application form which was then pilot tested and adjusted for improvement, rendering the final interview form used in the study. Teachers' audio recorded interviews were transferred to computers and given back to the teachers and participants for feedback to be used as a member check. In the data analysis, the content of the interviews were grouped in similar themes which lead to emerging themes. The data analysis was interpreted using a qualitative data analysis program. As a result of the data analysis, themes

were found that indicated teachers with democratic values effectively build democratic classrooms. The findings also indicated that teachers with democratic values anchor their practices in duties, fair behaviors, student's range of freedoms, and equality of opportunities.

Based on the analysis of collected data from democratic practicing teachers' viewpoints, this study has lead me to wonder how people develop democratic values and beliefs. The study has provoked me to think beyond the strategies that I will need to use in the classroom with students and consider what teacher strategies I will need to develop in order to facilitate a student- directed democratic learning environment.

The study appears to be transferable because the study's external and internal validity was strengthened by close adherence to the qualitative analysis criteria. What might affect transferability is that the study is a single case study but its findings can be compared to similar case studies and scholarly articles I have reviewed. Another transferability consideration, is that the study took place outside of the United States and the possible differences in academic attitudes could be a variable that affects internal validity.

I can trust the findings for credibility because peer debriefing was done after the interviews were transferred to the computer, by the 50 teachers in the sample group for review and changes. Triangulation was met by using member checks; debriefing was done by 5 instructors with education science doctorates who gave feedback in the form of comments and opinions in addition to reviewing field related research literature. Because each step in the process was explicitly described, defined and adhered to, the case study also passed the confirmability audit providing data tracking back to its source. The dependability audit was met at the same time using case study protocol; each step in the process was detailed revealing emerging themes, suggesting this study was a predictable event, not a fluke.

This study has informed my thinking about what a teacher needs to believe and understand about democracy to develop democratic values. As a future teacher I value the views of experienced practicing teachers' instruction in a democratic classroom. I am interested in further research into developing the attributes of democratic teachers to inform and develop my practice, instruction and application to support student learning.

**Autonomy for democracy in a primary classroom.** Burk and Fry (1997) used a qualitative case study to explore how a first year teacher's autonomous teaching beliefs were translated into classroom practices to attain student participation in the classroom which may develop a democratic learning environment. Homogeneous sampling was used in the case study because the teacher had been observed by researcher Burk as part of a state first year teacher support program. During Burk's first observation, she noticed that what was happening in this first year teachers' classroom was different than all other first year teachers' classrooms she had observed in the past. Researchers, Burk and Fry, joined together to explore in depth the extreme contrast between this particular teacher's instructional practices and others. Based on initial observation and an interview with the teacher to be studied, the teacher's beliefs and convictions on autonomous teaching and how they were implemented into practice lead to the development of the research study's focus (DeVries and Kohlberg 1987). The teacher in the study was a first year teacher, teaching 19 students in the first grade in the only elementary school in a small town with a population of 6,000. The students in her classroom were from Latino, African American, Native American, and Euro American descent and labeled by the researchers as having low socioeconomic backgrounds. The teacher observed in this study had moved to the United States from the Philippines when she was in her twenties.

From this point further in the annotation, the teacher will be referred to as Nina, the same name used to refer to the teacher/subject in the study. To explore answers to their focus question, Burk and Fry offered rich description on Nina's personal and academic background, in particular her autonomous teaching beliefs which were evident by her request for children with difficult home lives to be placed in her classroom. Detailed word, theory and concept definitions were provided so that the reader would understand the context in which specific vocabulary was used. The researchers' interpretive case study collected data using audio and video tapes of activities in the classroom, interviews, observations and Nina's journal reflections recorded bi-weekly over a seven month period. In addition to Nina's interviews, interviews were also conducted with the school principal, peer teachers and on occasion Nina's students for clarification. An initial broad set of questions were used in interviews to allow for emerging important issues. Tapes and interviews were examined for emerging themes and were then coded. The study concluded that all the themes were found to be tied to "one overarching belief: autonomy" (p. 647). They found four themes included in the overarching belief: (a) valuing individuality combined with group membership for all; (b) use of questioning to activate thinking; (c) making behavior expectations clear; and (d) the behavior expectation of accepting responsibility for one's actions.

I found the study useful in understanding the importance of the four themes that are part of the overarching belief of autonomy as concepts that should be employed in a democratic classroom. The study provided some examples of strategies in practice demonstrating the four overall expectations that could be part of setting up a democratic, student-directed classroom. Because there was only one study and the thick description of the research method was not provided, I did not find this study to be transferable to my practice as a teacher in setting up a democratic classroom. For transferability I was looking for step by step processes, in this study the processes seemed vague. Other reasons this study lacks credibility is the absence of peer debriefing, member check, triangulation, and confirmable audit. The findings do not seem to support the purpose of the study as the majority of the study focuses on connecting each data collected to Nina's activity. The study has good, useable information for future teachers and emerging themes. Even though themes emerged, the study did not provide a dependability audit. Furthermore, because of the absence of credibility in the methods and procedures I am unable to determine if the events in the study are predictable or a fluke.

The study helped me think about my question in setting up a democratic classroom by pointing out in the findings and implications that I need to consider that there will be external pressures for me to conform to traditional instructional practices. I will need to seek-out like minded educators when validation is needed and that instructional practices supported by theory are a teacher's best ally. The study also pointed out that there is a difference between educating for democracy and education as democracy. The value to the teaching community would be to illuminate the distinctions between teaching for democracy or teaching as democracy and knowing that each can be practiced alone or together. Teaching as democracy is more connected to my question because it focuses on strategies of active participation and student and teacher collaboration in decision making.

**Effects of student participation in classroom decision making.** Organizational researchers have proposed that participatory shared decision making, the keystone of most organizational development programs, can increase motivation and morale in participating individuals (Dachler & Wilpert, 1978). The idea that student participation in decision making could be of benefit in schools

and classrooms to motivate students prompted Richter and Tjosvold (2008) to consider the implications that shared decision making would have on students' learning.

Discovering that there was little scientific evidence on the effects of shared decision making in educational settings the researchers, Richter and Tjosvold, set out to investigate student involvement in evaluating, generating, and choosing major classroom educational decisions and the effects participatory shared decision making may have on students in an educational setting. Richter and Tjosvold (2008) performed a quantitative controlled experiment using the pretest and posttest control group design to show how student shared decision making effects student's attitudes towards school and subject, their interaction with peers, student's motivation and student's learning. In this experiment they studied two schools using two randomly assigned conditions, the student participation condition and the teacher planned condition. The results of the study indicated that students that shared in decision making in an educational setting showed an increase in positive attitudes toward school and subject, increased interaction with peers, more motivation, and increased learning, suggesting democratic practices in school classrooms are effective learning strategies.

To prepare for the study, Richter and Tjosvold, read scholarly literature on both the pros and cons of implementing democratic practices and procedures in classrooms and schools. The study took place in two elementary schools using 14 classrooms with a total of 304 students representing four grades 3-6, that were randomly assigned to two conditions, the experimental group, student participation condition and the controlled group, teacher planned condition. Teachers were also randomly assigned to one of the two conditions. There were 21 to 29 students that were heterogeneously assigned to two classrooms and balance modifications were made for behavior problems and sex. Participating students consisted of all students, grades 3-5 for two schools and grade 6 for one school, living in the same community, mostly from working class families, mostly Caucasian with a small number of Spanish –surnamed students. The 6<sup>th</sup> grade classes from one school were excluded because they were the only homogeneous grouped social studies classes in either school. In the student participation condition, the group receiving the treatment, students choose the social studies topic and main learning activity with the teacher. In the teacher planned condition control group students were not involved in the decision process, but used the same social studies topic and activity as the experimental treatment group.

The experiment took place over a five week period. Students completed pre-achievement and post-achievement tests, and were observed by specially trained observers, during instruction for peer interaction and motivation. First teachers and students of the treatment group spent 45 minutes planning topic and instruction and then reported the decisions to the control group teachers. Next students in both groups took the pretest after which instruction begin. During the next five weeks of instruction the trained observers completed the supervised work, internal motivation form and the peer interaction form. At the end of five weeks both groups took the posttest and completed the attitude measuring questionnaire.

The independent variable of the experiment was the extent of student participation in classroom decision making. The treatment groups practiced shared decision making with the teacher using brainstorming, opinion expressing, evaluating options and consensus to make decisions (Wood, 1973). In the control group, teacher planned instruction, the students were told by the teacher what the topic and activities were without referring to suggestions or reactions of students. Reactive and nonreactive instruments that directly or indirectly influence a behavioral reaction, were used to

measure the dependent variables of the effects of student participation on attitudes towards school and subject, interaction with peers, motivation to work on classroom activities and learning.

Because of Richter and Tjosvold (2008) strong adherences to the quantitative true experiment design of pretest and posttest control group design, the study highly indicates generalizability. The study appeared to eliminate all threats to external validity by using random assignment for all participants, providing specific treatment description for the experimental and control group, and supplying cultural and contextual factors about participating students. Modifications were used to balance sex and behavior problems and the 6<sup>th</sup> grade classes of one school were eliminated from the study because they could not be homogeneously matched.

The experiment pretest and posttest control group design is regarded as a design that has high internal validity because the design has built in controls for a majority of factors that affect internal validity. History is controlled because both groups are affected. Testing and maturation are controlled being evident equally in both groups. Regression is controlled as mean differences when both groups are randomly assigned and compared as demonstrated in the three tables, two of which are pretests and posttests, all three tables showing significant gains. Randomization was used for selection control and mortality was controlled by having all students in both groups take the pretest and posttest. Objectivity was met in the study with the use of school staff to facilitate the study. The study demonstrated reliability in the procedural and method descriptions with stating modifications made, significant testing, and observer training. Not only can I generalize this experiment to my classroom practice, but based on the strengths of its controls the experiment seemingly could be generalized to any classroom and applicable to all subjects or studies.

The findings suggest the experimental study was so strong that democratic strategies of student participation in shared decision making in classrooms and schools increases and improves student's attitudes and motivations towards learning, student's learning and academic achievement, and student behaviors. In my search for strategies that can be used in setting up and building a student democratic classroom I have often thought about ways to engage my students in their educational processes and motivate them to take ownership of their learning. This study attended to my need for significant results from research to validate the benefits of democratic strategies in a classroom.

This study also helps me to think about the first part of my question, what are effective strategies necessary to set up a democratic classroom. This study helped me recognize that teachers need to look at strategies to make themselves effective and important tools in setting up a democratic classroom by modeling democratic values.

I can use this study to begin thinking about how to develop democratic values as a teacher. I need to develop democratic values in order to model them for students. I want to know what this modeling looks like. I think I can begin to answering this question with observations of teachers using this strategy and practicing it in my student teaching placement. I can most likely transfer this study and use it as first steps in building a democratic classroom. I can do this by further researching self-directed learning, holding class community meetings and providing students opportunities to share in decision making.

**Democracy in the classroom: Empowering students.** The purpose of Morris (2011) research study was to empower students to take personal responsibility for learning and behavior. This is a mixed method research study founded on the constructivist paradigm. The author transitioned students gradually from traditional teaching instruction and methods to a cooperative, collaborative teaching instruction and methods and eventually moved on to more student involvement

in classroom decision making. Morris (2011) is a student teacher in the classroom where the study took place and administers the test as well as makes and records observations.

The sample was not randomly selected, it was a sample of convenience. The participants were 58 high school students in Honors English from 1st and 3rd period classes selected by the researcher as the sample groups, 40 of which were white, 17 black and 1 Hispanic. The study lasted three weeks. The treatment increased weekly over the three week period. The first week participation was asked of the sample groups to assist in creating guideline for fair classroom discussion. The second week students were offered suggestions and options but directed to make their own decisions. The third week students were asked to create a learning agenda for a lesson. During each activity students were observed and encouraged to peer and self-regulate.

I found the study too vague to make any determinations regarding its value to my question. The authors purpose was established by the study lacked mostly all of the criteria required for both qualitative and quantitative research studies. As a mixed research study it was neither transferable nor generalizable. The study did not seem to present internal or external validity criteria. It would appear not to be considerable as a study except for the exception using mean tables for results. The ideas behind democratic learning strategies were interesting but it seemed to be incomplete and hard to follow. The study did not provide clear description or supporting evidence. The finding showed no significance in change from the treatment. In fact student's means scores dropped after treatment. I would not consider this study as an indicator of the effects of shared decision making.

How this study helps me think about my question is to consider the value of planning democratic participation instruction. Shared decision making needs practice over a period of time to be able to determine its effectiveness. Further research and observations of experienced teachers of democratic practices would allow me to see the practices in action and how students might respond.

This study helps me think about the first part of my question, what are effective strategies necessary to set up a democratic classroom. This study helped me recognize that teachers need to look at strategies to make themselves effective and important tools in setting up a democratic classroom. I can use this study to begin thinking about how to develop democratic values as a teacher. I need to develop democratic values in order to model them for students. This study may help me with first steps in building a democratic classroom. I can do this by further researching self-directed learning.

**Summary and implications.** The findings in the research studies indicate that democratic classrooms are based on democratic values and are a practice of continuum or scope that develops over a period of time to be effective. The evidence indicated that shared decision making and student choice are agreed upon as the most important strategy in setting up a democratic classroom. Not all studies were generalizable or transferable but the ones that were demonstrated a high level of strength internal and external validity. The studies that showed weakness did not account for or take into consideration significant variables therefore the findings were not reliable or dependable. Because of the high level of transferability and generalizability of two of the studies I believe I can start the process of utilizing strategies to set up a student-directed democratic classroom. Student participation in shared decision making was a recurring indicator in the research for student engagement leading to increases in student achievement and student motivation. When I view the pattern of student participation as integral to the effectiveness of building a democratic student-directed classroom further exploration of student participation would be needed. To support my exploration of student participation scholarly expert articles, research studies and observations of practicing democratic classrooms would be beneficial resources.

There seems to be no guarantee that building a democratic classroom will manifest in the same manner successful ones have. I will be prepared to make modifications that best fit the needs of the student's individually and as a learning community. My next steps are to see how democratic learning strategies fit in with the Common Core State Standards and the emphasis of problem solving and critical thinking. I would propose democratic strategies would be a beneficial tool to meeting CCSS goals.

### **Long-Term Planning and Academic Rigor in a Student-Directed Classroom**

*by Kelly Shaffstall*

The focus and purpose of my investigation is to understand the implications of academic rigor and long-term planning in the student-directed classroom. When looking at effective strategies for student-directed classrooms we must ensure that the strategy attends to the depth and breadth of class content. Student-directed classrooms, if effective, could demonstrate a long list of benefits. Student-directed learning could mean more input from students as individuals leading to more personalized and more applicable content; it could also entail better interconnectivity and application of knowledge as inputs from multiple students with vastly different prior knowledge and experience come together to direct their learning. The foresight of long-term planning and the professionalism, academic language, and conceptual understanding of academic rigor must also exist.

Dewey (1937) stated, "...it is a fair estimate that the absence of democratic methods is the greatest single cause of educational waste" (p. 224). So the claim is that there is something missing or wasted by not using democracy in the classroom. Keeping Dewey's claim in mind; Bransford, Brown, and Cocking's (2000) *How People Learn* explain a difference between experts and novices. They explain that, "experts have acquired a great deal of content knowledge that is organized in ways that reflect a deep understanding of their subject matter...Novices' knowledge [in contrast] is much less likely to be organized around big ideas; they are more likely to approach problems by searching for correct formulas and pat answers that fit their everyday intuitions." So if students are novices in the content, there might be a worry that student-directed, or novice-directed, learning will not have the depth into content that experts provide.

The problem might look something like this; students are having a deep and insightful self-directed discussion on the sinking of the *USS Maine*. Without expert assistance they will not likely gain the content knowledge: the sinking of the *USS Maine* is often categorized as a *false flag initiative*. They also might not come to the conclusion the sinking of the *USS Maine* has implications for understanding the *Gulf of Tonkin Incident* which will be discussed later in the year.

Students come to the classroom with a variety of prior knowledge and experience. It might be that this experience helps them with the content at hand and might even help them to assist a peer in the content. This seems logical. However, even if half of the students knew the content very well it might be hard to guarantee the knowledge would be adequately spread over the full classroom cohort without facilitation. This also seems logical. There would appear to a gap here between the benefits of a student-directed classroom and the possibility of a lack of academic rigor and long-term planning within the classroom. These two possible issues are the focus of my inquiry.

**What is preferred and why: comparing self-directed and teacher-directed learning.** The study, "Preclinical Students' Predispositions toward Social Forms of Instruction and Self-Directed Learning" is a qualitative study by Radial and Volet (2008) which looked at what method of study

students preferred; traditional schooling or self-directed learning? The study was conducted by having two groups of students, one in a traditional learning environment and another in an alternative (student-directed) learning environment. Students then answered a questionnaire on their experience, and judges organized the responses. The study concluded that 32% of traditional learning participants and 26% of alternative learning participants actually preferred external directed self-contained learning compared to the 4% and 3%, respectively, that preferred the self-directed social learning. The judges arrived at this conclusion because the alternative learning group often referred to passing the subject and the traditional learning group often referred to achieving high marks.

The study came to this conclusion using the mixed methods approach to examined two groups through questionnaire data and guided reflections. This data was then analyzed and categorized by two judges one of would be categorized as double blind. There was a third judge who acted as tie breaker for the relatively few split opinions between the first two judges. The participants were secondary veterinary science students about half of whom were over twenty years of age. This mixed methodology quantitative study grouped student preferences into a table of nine sections ranging from solo learning to social learning and external directed to self-directed learning.

The researchers of this study wondered if students might have opted for external control rather than self-directed learning due to the workload of the program. The study also admitted that perhaps the students favored traditional instruction simply based on familiarity and that the time allotment was a factor because more information can be packed into a lecture than a class discussion. These predictions seem to correlate directly with the concepts of vigor and planning.

This study's findings are not generalizable because the subject group, preclinical veterinary students, was too specific to apply to education as a whole. There does seem to be some generalizability, though, with students seeing teacher-directed learning as covering more content in less time compared to student-directed learning. This makes sense on a basic logic level; one person making decisions or presenting information will cover more information in less time than a group discussion. However, this says nothing about the merits of either.

The findings of this study appear to be credible and internally valid yet there are questions of its dependability and reliability. The study was broken into two groups: a control group and a test group categorized by established criteria. Students reflected on their learning experience and the reflections were divided into nine categories: three from solo-learning to social-learning and three from external-directed to self-directed making up a table of nine squares. The study had two judges coordinating assignment of criteria with one blind judge and a third judge as a tiebreaker. The stages of the three judges and the two test groups created checks against bias strengthening the internal validity of the study. Where the study fell short is in dependability and reliability, the critiques named above that content level, timeliness, and workload played bigger parts in responses than students' actual preferences.

When it comes to dependability and reliability I wonder if this study is biased by common convention. The participants were secondary veterinary science students about half of whom were over twenty years of age perhaps having a lot of experience in a teacher-directed solo-learning environment. Perhaps they saw teacher-directed instruction as asking less of students. The purpose of my investigation is to improve student input into the classroom with a goal being to ask more of students. Perhaps people might be more comfortable with the traditional method but that is no argument for continuing it. It could be that more factual information is packed into a lecture rather than student lead discussion but in which of these scenario are the student doing the thinking? And

finally, looking at time allotment, it could be said that student-directed learning takes time, and time is limited, but I wonder if students' mental capacity will be better used exploring their own inquiry than addressing passive external stimuli. Therefore I believe this study's conclusions are a result of current practice rather than a demonstration of preferred practice.

What this study means for the goals of this research is that students might see issues with rigor and planning in a student-directed environment. The problem not only seems possible but students seem to predict it will happen. The standard is certainly teacher-directed learning and this study seems to demonstrate that students have a comfort factor with this method that is important to note. What this means for practice: if a teacher is striving for a student-directed classroom students might prefer a traditional teaching style and breadth of planning and depth of content rigor might be areas of concern to address.

**Process and content in the student-directed classroom.** Hall and Steele's (1971), "Self-directed, Self-Relevant Learning" study was a qualitative study which was part case study and part quasi-experimental. The researchers' goals were to compare their self-directed class's response to a survey which was also taken by traditional humanities classes and compare the results. The surveys examined had students rate ten dimensions of teacher behavior. Of these behaviors were, "interaction facilitation, willingness to change, student control, feedback on student work, personal rapport with students, quality of instructor's contribution, and task concern" (1971 p. 98).

The study found that the student-directed class scored above average on all dimensions. Hall and Steele (1971) explained, "We summarize these main effects as: (1) a value shift toward collaborative decision making, (2) a greater sense of individual responsibility for choice, (3) development of trust as a norm in relationships, and (4) use of problem solving rather than competition as a means for accomplishing joint ends" ( p. 103). The researchers also explained that an important ingredient for success was, "student's capacity for self-direction" ( p. 103). Douglass Hall and Fred Steele recommend opportunities for self-direction, feedback on these opportunities, and coaching on utilizing future opportunities.

In conclusion, however, the researchers found several issues with the student-directed method. They stated that, "gain in cognitive learning was not nearly as great", groups struggled to set agendas and the program suffered a "flight into process" (1971, p. 106). This is related to the study above where students claimed teacher-directed instruction provided more content knowledge. If students don't know the content but they are directing their learning in it how can they be expected to access conceptual and in-depth content knowledge? Other issues included time constraints. The demands of this course were estimated to be equivalent to at least two conventional courses. Again this is like the above critique of time allotment; a valid concern.

This study does demonstrate transfer because the surveys were of students' own thoughts and opinions of their respective classes. The study didn't have general application because the participants were Yale students and also because students choose what classes to be in so the participants weren't randomly selected or randomly distributed between traditional and self-directed learning. This study does seem credible due to the fact that the study took place over years and covers a wide range of classes and students. When it comes to validity this study falls short of experimental criteria. Groups are not random. Although there is a standard and test group, as stated above, students applied for these classes. Dependability was also damaged due to the lack of randomness in both selection and sampling. The study seem reliable only in observations and testing where the content was made by

students meaning that the student-directed classroom was interpreted, tested, and explained through the students lived experiences.

For the purpose of our research this study makes an interesting discovery; this concept of “flight into process” that students in a self-directed environment suffered. Like the idea from *How People Learn* about experts and novices and their ability to see and work with various aspects of content; the novice students of this course had no problem grappling with the content’s implications for their life and getting into broad based discussion but their inexperience with concepts made the more expert information distant and inapplicable to their current understanding. The researchers’ stated, “Perhaps in the great enthusiasm that arose for discussing interpersonal process issues, concepts seemed dull by comparison. Anyone who introduced conceptual issues was listened to by the group – but not encouraged” (1987 p. 106). This seems to mean that students will eagerly discuss interpersonal connections to content and elaborate their understanding in a student-directed environment but that the rigor for contextual exploration is not necessarily there independently and might need facilitating. This understanding is key for the inquiry at hand.

**Is there bias in predicting student’s level of self-directedness?** The next study I researched dealt with “Guglielmino’s Self-Directed Learning Readiness Scale” or SDLRS. This study, “Guglielmino’s Self-Directed Learning Readiness Scale: A Validation Study” (Long, Agyehum 1982), was a qualitative quasi-experiment. It was quasi-experimental because it was looking for racial bias in the SDLRS and so was not random in assignment of conditions. This study was a validation effort using modified multi-trait-multi-method procedures to compare faculty’s self-directedness ratings of their students to SDLRS and other scale ratings. To do this the research was done at two institutions one with primarily black students and the other with primarily white students. The procedures of the study sampled 136 college students, 63 black adults, 70 white adults, and 3 of foreign nationality. Each student was tested with Guglielmino’s Self-Directed Learning Scale, Agreement Response Scale and the Rokeach’s Dogmatism Scale.

In the SDLRS, other scales and teacher assessments students were graded on exhibiting initiative, independence, persistence, responsibility for one’s own learning, one who demonstrates study skills and time management, and one who is goal oriented. If the purpose of this inquiry was to look at implications of rigor and planning in a student-directed classroom when responsibility and time managements are applicable skills to determine. This study concluded that the SDLRS was not racially biased because black students’ scores were consistent across multiple tests. This is great for SDLRS and its validation; but the study discovered something else which is troublesome. “White students scores significantly lower on the SDLRS than did the black students...[yet] White students received significantly higher faculty ratings on self-direction in learning than did the black students” (1982 p. 82). Racial bias in schools is known and has been demonstrated in several works. For our purposes though it is troubling to think that teachers might be expected to see their black students as unfit for self-direction. It seems unlikely that an instructor will adequately provide democracy in the classroom if they see some students as less of self-direction.

The findings of this study has generalizable implications for the classroom because it is assessing teachers general categorization of students’ self-directedness. This seems to demonstrate that to accurately facilitate rigor and planning in a student-directed classroom teachers must accurately understand their students’ abilities. This study demonstrates that students who are African American might not only be less expected of self-directedness but they might be more capable than their peers making the teachers assessments even further from reality.

Long and Agyehum's study was both credible and internally valid and objective because they tested multiple self-directedness scales as well as teacher assessment against each other and in regards to multiple age and racial differences. The test is quasi-experimental due to the non-randomness of participants after selection this was done to accurately test the results of SDLRS and other scales against preexisting racial divides. This was a reliable and dependable use of testing procedures for finding the effect of an item on two parties. Though the participants were not random so racial bias could be determined the study used several scales and teacher assessment to compare results.

For our inquiry into student-directed classrooms and the study of rigor and planning these findings are important. These findings are important because it damages student-directed learning when a teacher expects a student to be less capable of self-direction. If rigor and planning are struggles in a student-directed setting, one would think, there needs to be an understanding of students' abilities to adequately address these struggles.

**Studying the effects of anonymity on students' voting.** The next study looked at the process of voting in the classroom. "Anonymity in Classroom Voting and Debate" (O'Malley and Buda, 2011) looked at three studies with sixteen and seventeen year old students in vote-debate-vote scenarios. The purpose of the studies was to explore the differences between voting publicly or privately. The first study looked at "the impact of anonymity on opinions (expressed as votes) prior and post a publically held oral debate" (p. 367). In study two voting and debating took place in a computer network with three different voting conditions: a private condition where only students could see all votes indicated by color but not name, a private condition where students could only see their own vote, and a public condition where students could identify the votes of others. Finally in study three both voting and debate was in an electronically anonymous or public condition.

This collection of studies was quasi-experimental in that the classes selected were made up of the students already enrolled prior to the research so it technically wasn't completely random. The studies were also quantitative in that they focused on demographics of calculating input and vote shift. The study looked at source and participant anonymity where students either knew the participants but not their choices or where students didn't know participants or choices. The study focused on vote shift which is examining the differences between students' first votes and their votes after a debate. The reason for this study was that teachers, student, and classroom observers agreed, "a few dominant students' voices led the classroom discussion. Once a position had been stated by such an individual, the other students felt either unable to offer an alternative position and simply agreed with this view or simply remained silent" (O'Malley and Buda, 2011, p. 367). This is certainly an important issue for equity and student input through democratic practice. We want students to display academic rigor in their development of content knowledge and so snuffing of democratic discord is certainly an issue.

Study one, which looked at public and private voting before and after an oral debate, found that, "those in the anonymous condition showed a greater amount of vote shift to those in the private condition" and that, "in the second vote: there was no significance between the anonymous and private conditions" (O'Malley and Buda, 2011, p. 369) with this they concluded that, "Anonymous voting in this study...seemed to have provided the optimal state. It allowed students the freedom to reflect their changes in opinion as a consequence of the debate and to do so in a way that did not lead to conformity to the prevailing group norm" (O'Malley and Buda, 2011, p. 370).

Study two examined voting and debating on a computer network with three different voting conditions: a private condition where only students could see all votes indicated by color but not

name, a private condition where students could only see their own vote, and a public condition where students could identify the votes of others. For this study researcher's argued that, "students voting privately are more likely to express views in the debate that do not match their vote" and that, "The first two studies found no disadvantages and a number of advantages for students' voting on controversial topics in an open but anonymous manner. However, all the argumentation phases were conducted in public" (2011 p. 373).

For the third study voting and debate were in an electronically anonymous or public condition. In this condition there was no significant effect on how students' second vote deviated from the initial norm. A problem with the third study, however, was that, "the lack of accountability afforded by anonymity may also increase the amount of unwanted behaviors such as flaming, overt criticism or 'messaging'" (2011 p. 373). The researchers found that, "In the first topic debated, 15% of students in the public debate and 56% in the anonymous debate contributed at least one off-task post" this trend shifted however because during the final debate, "31% of students in the public debate and 19% in the anonymous debate went off-task, which is a significant reduction in the case of students in the anonymous debate" (2011 p. 375). The researchers suggested that if anonymity is only between students, but the teacher knows who is making what posts, than the positive effects of anonymity will maintain while off-task remarks will decrease.

In all the researchers concluded from the three studies that, "The comparison with students voting privately suggests it is not the exposure to information about others' views that causes conformity but the requirement to reveal one's own view" and that, "as off-task behavior rapidly diminishes it may be that the increased participation associated with anonymous debate is worth the initial short-lived problems" (2011 p. 375).

These findings are important because anonymity should be a careful consideration for certain items because it can allow students to be more honest in their responses and more likely to disagree with one another which is a step in the right direction for academic rigor. It also seems practical to think that, "students can find it difficult to debate with one another if they worry about expressing their views or the impact of disagreeing with others" (2011 p. 365) and so anonymous debating has its place in the student-directed classroom. A problem I have with this study's findings, however, is that it might be describing a false cause to their results. The explanation given is that students in public debate and public voting situations were more likely to change their votes than students in anonymous situations. Does this prove peer pressure affects voting, does this prove public debate causes students to be more critical of their views and more likely to change their mind, or is this showing some combination of these and other factors? The study argues that students, teachers and observers all found a handful of students setting agenda and no one willing to argue against them. If this is the case than anonymity serves to improve academic rigor in a student-directed environment but it must be kept in mind that someone changing their opinion in an external, and potentially positive, factor.

**Participatory economics as an example of democratic planning.** The next study looks at the planning process using a participatory economic democracy as a case study. "Participatory Economic Democracy in Action: Participatory Budgeting in Porto Alegre, 1989–2004" by Marquetti, Schonerwald da Silvia, and Campbell (2012) was what it sounds like; a case study of participatory economic democracy in Porto Alegre over the seventeen years from 1989 to 2004. This was a qualitative case study because they were looking at a society during a period of time. The purpose of this study was to analyze the benefits and shortcomings of participatory budget planning. The study

defined the participatory budgeting (PB) process as, “a form of participative democracy in which citizens and civil society organizations have the right to participate directly in determining fiscal policy. In particular they take part in determining how and where resources are employed in their communities” (2012 p. 63). The researchers found four key benefits to the participatory planning and participatory budgeting in Porto Alegre:

First, it supports the ideal of democracy, and not only in economic matters but throughout society. Second, it has a pedagogical effect in that participants learn about rights and responsibilities. Beyond that participants develop new capabilities that lead to a desire to further expand their capabilities, rights, and responsibilities. Third, PB improves the fiscal performance of governments. It increases the efficiency of the use of public resources, including the important issue of reducing corruption. Finally it has distributive effects in the spending of public resources, and in particular it tends to improve the quality of life of the poor (2012 p. 63).

According to the researchers, “City Hall specified to the PB Council how much the total investment budget could be. Operating under this constraint, the PB Council then proceeded to elaborate the investment budget for the city...while the city councilors did propose some changes, given the extensive public involvement in the creation of the PB Council’s proposal it was generally accepted largely as proposed” (2013 p. 68). To try and transfer these concepts; in the classroom City Hall might be translated into teacher and PB council into students, investment budget might translate into state standards. In this way a process for a student-directed classroom might be a teacher providing standards and overarching content for students to then propose desired goal and structure for the teacher to then make necessary practicality changes to so the process can move forward.

The researchers’ critiques of PB in Alegre are as follows: “even if PB participants deliberated over the total amount of investments, this would represent less than 2 percent of Porto Alegre’s GDP. This represents inadequate resources in relation to the needs of the population” (2012 p. 78). In a similar way a student-directed classroom will, for high school students, represent at the least one hour of their day and at the most six hours, for six classes, this is a drop in the water for creating meaningful planning or academic rigor among students in the large spans of their interactions in the social world as a whole. The researchers’ go on to critique that, “PB has been almost entirely restricted to operating at a city level. Hence it neither has access to the resources of, nor is it allowed to democratically determine the economic decisions on, the state or national level” (2012 p. 78). In a school environment this might be similar to saying that a student-directed classroom might help equity and leveling the playing field of a classroom but might not be able to effect social stratification of the school community as a whole. In other words an effective democratic process in the classroom might allow a popular student and a marginalized student to participate and interact at the same level but that might not ensure this relationship extends outside the classroom. This issue exists in the anonymous voting study as well. Long-term planning might be damaged due the student-directed atmosphere’s lack of existence in most of the student’s day to day interactions. The last critique has been brought up in most of the other studies. “It [PB] is only marginally concerned with long-term and other medium-term issues, as addressed typically in any system by city planning” (2012 p. 79).

The Yale “Self-Directed, Self-Relevant” study called this “flight into process” (1987), and the “Preclinical Students’ Predispositions toward Social Forms of Instruction and Self-Directed

Learning” study claimed that more factual information might be packed into a lecture rather than student lead discussion. This recurring concern is valid. If students who are doing the learning are directing the learning how will they be able to make long term goals? Bransford, Brown, and Cocking’s *How People Learn* distinction between experts and novices is an important consideration here. This does not discredit a student-directed classroom, though, it simply means that teachers are key as facilitators for providing rich content knowledge and context for understanding. It is the teacher’s role; it seems, to ensure that academic rigor and planning take place. In fact even *How People Learn* does not take their findings as an endorsement of teacher-directed learning, but rather teacher facilitated learning, because they state that, “Expertise can sometimes hurt teaching because many experts forget what is easy and what is difficult for students” (2000). A great theory for understanding this expert/novice distinction is Vygotsky’s Zone of Proximal Development. Vygotsky, as quoted by Kozulin, Gindis, Ageyev, and Miller, argues that there is only so much content knowledge a student can achieve learning independently and there is a higher level of content knowledge to be reached when learning with help from others. The gap between these two points of content acquisition makes up the Zone of Proximal Development. Vygotsky claimed, “What the child is able to do in collaboration today he will be able to do independently tomorrow” (1934/1987). What this means is that although experts might have deeper content and context knowledge and novices’ subject knowledge is more surface level; students working together in collaboration using their varied skill levels in varied experiences can achieve more learning collaboratively than a student could independently and more, even, than a student could achieve with the aid of a teacher expert. What this means for academic rigor is that if there is a gap between content knowledge and student-directed learning, as the studies above have demonstrated, the gap is varied for students based on prior experience and knowledge. Academic rigor and planning might be an issue in the student-directed classroom but it affects students differently and knowing and understanding these differences might mean access to rigor and planning for all students.

It seems to be that in a student-directed classroom a teacher must be a facilitator to ensure academic rigor and planning. To be an adequate facilitator a teacher must have adequate rapport with students within their self-directed realm. If the best process of group decision making is democracy and if the teacher must facilitate rigor and planning and if students prior knowledge and experiences is varied allowing for different levels of access to rigor and planning; than the process of democracy itself is an important consideration. The following are various concepts pulled together from Albert (2003), Gray (2013), O’Malley and Buda (2011), Blais and Bodent (2013), Erbes (2006) and Heineman, Peterson, and Rasmussen (1995).

**Types of voting.** Alternate Vote: a person gets two or more votes so that the array of options can be ranked from most desirable to least desirable. This method attempts to alleviate the spoiler effect, where votes are given to the “lesser of two evils” rather than a person’s desired choice so that a popular choice they don’t like is voted down, because with two votes a person can chose their favorite first and the lesser of two evils second or with more votes rank decisions according to preference. This method also tries to eliminate a two party system if the vote is recurring and other options fall away as voters move toward the two most popular options. This method is still susceptible to majority rule, where multiple voting choices with one winner means a smaller amount of votes will win, if used in a winner take all method (Gray, 2012-13). Example: students are given a slip of paper with the choices listed and must rank or select their top two choices to be tallied for selection.

**One Person One Vote:** each person gets one vote for selecting a decision. This method is vulnerable to the spoiler effect as well as minority rule and a two party system, if the vote is recurring, (Gray, 2013). Example: students are given an array of options to choose from and must raise their hand once for their choice. Because they only have one vote they don't want to "waste it" on a choice that probably won't win so they chose the most comfortable of the two most popular choices.

**Scale Voting:** each option is ranked on a scale of in favor of or against the decision (Gray, 2013). Example: fist of five where students publicly display zero to five fingers corresponding to: zero fingers, "I disagree so much I will sabotage this decision if it goes forward", three fingers, "I am not for or against this choice", or five fingers, "I support this decision so much that I will be a leading figure in it." Often students who rank a decision zero or one must explain their reasoning.

**Methods of counting votes.** **First Past the Post/Winner Take All:** In this method of tallying votes whatever option receives the highest number of votes is devoted to one hundred percent. This method is subject to the spoiler effect, a two party system if the vote is recurring and minority rule (Gray, 2013; Erbes, 2006). Example: students are presented with an array of disciplinary actions for late work and the option with the most votes is the sole route taken. Because only one option is taken students may choose the lesser of two evils rather than their preferred choice.

**Percent to Pass/Consensus:** This method of counting votes works in connection to other methods. The most common two methods are fifty percent plus one vote wins or consensus but other options also exist such as two-thirds must approve. It is susceptible to spoiler effect but tries to address the issue of minority rule (Albert, 2003; Gray, 2013). Example: because consensus requires too much time and fifty percent plus one allows for too much dissatisfaction students opt for a three-fourths majority rule when it comes to decision making.

**Proportional Representation:** This method means that choices are implemented in proportion to the amount they are voted for. This method works with several voting types and avoids the spoiler effect, minority rule and two party systems (Blais & Bodent, 2013). Example: students are deciding what aspects of a chapter to spend their time on over the next week. 75% of students chose option "a", 15% chose option "b", and 5% chose option "c" or "d". Proportionally three days of the week are spent on option "a", one day is spent on option "d" and the last day is spent on "c" and "d".

**Republic:** This is a faster method of determining decisions; an initial vote by the whole group selects members to represent the group as a whole on future decisions (Heineman, Peterson & Rasmussen, 1995). Example: table groups vote for a student to represent their table then the representatives from each table come together as a smaller group to vote on what the final unit project should be for the whole class.

**Councils:** Similar to a republic a council is a small group that is entrusted in making decisions for the whole. With councils their decision making power is relegated to one aspect or category (Albert, 2003). Example: five students make up the student needs council which includes rules and regulations on food, drink, and bathroom breaks. A council of eight students determines class supplies such as what supplies are available at the table groups or how supplies for projects are distributed.

**Voting situations.** **Public/Private Voting:** A person's vote is made in anonymity or is known by another or all participants. These choices deal with vote shift which is what occurs when peer pressure of spoiler effect encourage a person to vote in a way they would not have in anonymity (O'Malley and Buda 2011). Example: a student sees that a popular student has voted a certain way and many other students do the same. Seeing this the student decides, rather than individually deciding how to vote, they will appeal to peer pressure and vote the same as the other students or if

they very much disagree with the popular student they will cast a protest vote to the next most popular decision.

**Veto:** Similar to the zero and one finger options of fist of five, a veto allows a group or individual to drop a decision what was otherwise approved (Albert 2003; Heineman, Peterson & Rasmussen, 1995). Example: students overwhelmingly approve a project that involves taking photographs of themselves. This is against one student's religion. Rather than having to convince a huge section of the student body to change their mind this student simply vetoes the option.

**Choosing Options/Choosing Between Options:** This affects all types of voting. How are the options for what is voted on determined? (Albert, 2003; Marquetti, Schonerwald da Silvia, & Campbell, 2012) Example: students decide what rules and expectations they want to impose on the classroom. The teacher then provides a range of outcomes for students to vote on as reprimands for those rules and expectations.

**Proportion Affected:** This simply means that different methods or persons are involved in various decisions in proportion to their impact (Albert, 2003). Example: a student wants to use a mechanical pencil rather than a wood one; they alone make this decision because it affects no one else. A student wants to use a pen rather than pencil; this is voted on as a table group because table groups work together and students might want everyone at the table to use pencils for the sake of editing. Finally; a student would like to use a laptop to type their work. The whole class votes on this because the laptop might pose a distraction or disproportionate benefit in the classroom.

With the limited resources, accessibility and time restraints on this current enquiry I have not been able to adequately research these various voting aspects and their implications for academic rigor, planning and student-directed classrooms at this time.

**Summary and implications.** The research appears to establish an understanding that student-directed classrooms struggle with academic rigor and planning. Each study calls the issue something different but the problem seems to stem from these two key issues. The solutions laid out in our limited research so far seems slim. The benefits of a student directed classroom are named repeatedly from the benefits of voting in debate, to community planning in decision making, to developing students self-directedness, and an increase in values, trust, and relationships.

In Hall and Steele's (1971), "Self-directed, Self-Relevant Learning" they claimed that the start of the program was hard and going back to teach-directed seemed like the solution but they waited and were glad they did as student interaction improved. O'Malley and Buda's (2011) "Anonymity in Classroom Voting and Debate" students were off task at first but given the time were able to vote and debate with improved interaction and less off task behavior. There is this idea of waiting. In a student-directed classroom a teacher is waiting for students to act. The connection here is perhaps small but important. Teachers, especially in a teacher-directed classroom, are usually instructing as experts. If a classroom is student-directed the teacher isn't instructing students but facilitating them. It would seem that to solve the issue of academic rigor and planning in a student-directed classroom a teacher would address the problem as a facilitator rather than an instructor.

Within my own practice I can now think of student-directed learning not as failed, because it is missing academic rigor and planning, but as needing facilitated access and assistance in rigor and planning. During seminar, or projects, or presentations, or other aspects of education where students are directing the learning I can go into the experience knowing they might struggle with rigor and planning and assist them in this process. I can remind students of key terms, explain connections to theory or academic language these points will help with rigor; I can explain how the subject at hand is

built off the last unit, or how it is leading to the next unit, or how the work might reflect other work throughout the year to get students thinking about long term planning and avenues for long term connections.

Moving forward I would like to look at the role of voting to help me better understand how to address and influence and use the input of student-directed learning. How voting is conducted and measured have implications for its outcome and I would like to know more about the process of this and how it has been used effectively in the classroom.

Once I understand how various types and measures of voting can be successfully used in the classroom for various situations I can then start to understand how to use democracy in the classroom to solve rigor, planning, and other issues that arise through a student-directed learning environment. This is my goal moving forward.

### **Democracy Relating to Classroom Management**

*by Christy Turnbow*

My question, “Can I use lessons in democracy as a way to increase the effectiveness of my classroom management?” focused on relating democracy to classroom management. I focused on the effect student choice has on the learning process. To find studies relating to my question, I searched *JSTOR*, *Ebscohost* and *google scholar*. My search for studies included the terms: *democratic education*, *elementary classroom management*, *student-centered*, *student-directed* and *self-efficacy*. I found many studies relating to classroom management but it was very difficult to find studies relating to a democratic classroom management style. I found one study relating civics education to increase the effectiveness of classroom management. The other studies that I found, one was from another democratic country and another included small sampling sizes. The others were more solidly designed with bigger research groups.

All the studies seemed to reveal that a student-centered focus was important to creating positive attitudes toward learning. They also acknowledged that students were better able to justify their answers with valid arguments when taught from a more democratic approach (Davis, 2010). Students’ ability to choose in various activities and settings positively related to better attitudes towards school in two studies (Davis, 2010. Schuitema, et. Al., 2009). Overall, the studies concluded that a student-directed approach lead to more positive attitudes toward content and school in general.

During my fall student teaching experience, I continually felt like there was not enough of me to go around to all the students. I structured my lessons in a way that had the students gain knowledge from what I was telling them, then go out and work with each other to complete assignments. I wanted them to rely on each other to answer any gaps I had left in their understanding. Many times, after I prepared students to go out and work, there would be so many questions that I was unable to get to all of the students during that class period. They were not helping each other understand or collaborating to figure out the problems. This wasted a lot of time for the students that still had questions and were unable to do their work. It progressively made understanding the content worse every time I left questions unanswered. I was also wasting time getting after students who were distracting themselves and others during work and instruction time.

This made me wonder about the engagement of the classroom content and my instructional method. Most of the time, instruction and answers purely focused on me to give students guidance, instruction and knowledge. I often asked questions and relied on the students to answer them during

the instruction time in an effort to increase student engagement. Though, when they would answer, I would evaluate and give them the reasoning to the validity of their answer. This IRE questioning approach always had me at the center of the conversation, relying on the students to answer questions I asked and already knew the answers to. After this instruction period, I had students work with their group or a partner to complete assignments. I did spend some time talking about effective group work and pair work, but it seemed lost on them.

I realized after much reflection, I did not include time for students to be disequibrated and have time to grapple with and explore new ideas effectively (Crain, 2005). In order for learning to be effective, Zull (2002) explains that new learning must be connected to prior knowledge; activating existing neuronal networks and providing learning experiences that allow for the learner to grapple with and eventually solidify new knowledge. Group work and relying on peers is an effective way for students to grapple and explore new knowledge. Duckworth explains the need for dialogue between peers in order to make sense of complex topics, "...Everybody's initial understanding is expanded by hearing from others" (1991, p. 9).

For these reasons, I decided to explore using a democratic approach to engage students and encourage them to see each other as resources. I believe lessons in civics right off the bat will encourage students to solve problems using each other as resources in the classroom. The design of lessons with a student-centered focus will allow for much more engagement and independence in learners. This engagement and independence will lead to better classroom management and contribute to lifelong independence of the learner.

#### **Student-centered practices result in more positive attitudes surrounding literacy.**

Through Davis' (2010) focus on collaboration, she found collaboration as a meaningful element in positively affecting children's experiences in literacy. It also reports a need for more modeling on effective collaboration. Challenge is the level of difficulty of a certain task. In this study, she differentiated tasks to allow for an appropriate challenge for all students. Davis noticed that when the students were in a small group setting, students were much more positive about the experiences and opportunities for success. Shared control allows for students to make choices on how they are going to learn the information. The result of shared control in this classroom was a higher amount of engagement. Goal Orientation was implemented by comparing students' achievements to others and comparing student achievement to themselves. When goals were made that compared student achievement to each other, it negatively impacted the students' attitudes toward reading. When they were awarded for being better than who they were yesterday, they positively responded to the praise. Overall, student attitudes and engagement were better when they were given a choice, allowed to collaborate, and shared control of learning processes and outcomes.

Davis (2010) is seeking to figure out the most engaging and effective instructional practices to raise student achievement. She wants to find out whether skills-based teaching or *student-centered* teaching sets the student up for success in literacy in an elementary school classroom. This qualitative case-study examines using these two instructional approaches in her own classroom. She focuses on the effect of *student-choice*, collaboration and shared control of learning outcomes on student achievement. She makes use of quantitative data as well as questionnaires and surveys.

Davis' study focuses on 19 students. The students are at a variety of reading levels; three significantly above grade level, four above grade level, seven reading at grade level and five reading significantly below grade level. The students also came from mixed socioeconomic statuses and

mixed races. All the students spoke English as their first language. The researcher uses a mixed methods type of study.

For the study, Davis used two different curricular frameworks, both of which are widely used in today's classrooms. This study will examine the effects of multiple curricular models on students' experiences and interpretations by implementing these models and measuring students' experiences. She used three distinct questionnaires. One assessed students' predisposed attitudes about reading and their self-conceptions as readers. Another questionnaire combined information from a written survey and an individual interview to measure the personal dimensions of reading motivation. The interviews were coded for content relating to the two frameworks and students' general perceptions about themselves as readers. After the implementation of the two frameworks, all students completed self-reporting, group-administered questionnaires. The questionnaire was created by the researcher and focused on 13 items measuring student reactions to specific aspects of literacy instruction. The items measured students' valuing of literacy activities as they pertained to choice, collaboration, shared control in learning outcomes and appropriate level of challenge. She used students' assignments to evaluate the effectiveness of the collaboration versus individual completion and the effect student choice has on the assignment. She collected data over a four week period.

Davis' analysis involved the triangulation of both qualitative and quantitative methods. The coding process examined data's relationship to existing theories of student engagement and developed additional codes to reflect aspects of student experience. The research identified classroom structures as they affected student engagement and motivation. The findings are organized into six categories: (a) choice; (b) collaboration; (c) challenge; (d) learner control; (e) goal orientation; and (f) environmental context of learning.

Choice is a key variable between student-centered and skills based. The student-centered period allowed students to make choices involving which books they would choose. Students were also able to make choices between and within activities where students could control the learning processes and outcomes. This study's data suggests that a student's ability to choose positively affects their attitudes toward reading and that students are cognitively aware of this effect. Davis concluded that the ability to make choices surrounding reading increases the autonomy of the reader by utilizing their background knowledge and develops self-direction to choose reading activities.

This study seems transferable as her methodology was sound and clearly outlined. I can use this study to think about the nature of interdependence and to broaden my understanding of the kinds of practices that might contribute to this sense of interdependence. This study discusses the use of encouraging students' self-efficacy by giving them choice in the classroom. Student-centered practices encourage students to collaborate and share control in the classroom. The author and I share a similar goal for classroom management practices so I'm drawn to her interpretation. She is describing the types of choice and student-centered education that I also want to create. The way she allows students to choose their own books and collaborate in the learning process definitely has students at the center of their education. These practices increase student-efficacy. I'm interested in focusing my classroom management on strategies that help students develop voice and agency. So in that way, this study may help me think about the kinds of practices I need to learn more about. This study does have a range of student cultural make up even if there are only 19 students included in this study. I imagine that it will be similar to students I will encounter in my future classroom. The findings are convincing and I feel as though I can trust them because of such an in depth qualitative

research design. This study could be transferrable but since it was only performed in one classroom containing 19 students I am not sure whether they are predictable or a fluke.

This study was very specific to what she is focusing on. The focus on the two frameworks and the effects it has on her second grade students' literacy attitudes and achievements is useful to my future classroom. I hope to see the different influences the two frameworks of instruction have on students' efficiency in reading and to be able to take some of the positive attributes and put them into use in my future classroom.

**Dialogue improves student ability to justify and use multiple perspectives.** The results of this study by Schuitema et. Al. (2009), revealed that lessons for dialogic citizenship education improved students' abilities to use multiple perspectives when justifying their viewpoints surrounding historical topics. It also improved students' abilities to use multiple perspectives to justify topics that had not been discussed and are subjects of current debate. The results indicated that students are able to transfer their learning to other subject areas. The researchers also found that students' ability to take moral values into account was unable to be transferred to other subjects. The results of this study seem to be generalizable as their research design was very detailed and they used multiple measurements. They also used outside unbiased raters to score their work.

Schuitema et. Al. (2009) sought out how citizenship education can be integrated in a history classroom. They emphasize the importance of stimulating dialogue while in the classroom. The researchers wanted to find out more about the effects of dialogue on students' success in justifying opinions. They implemented two curriculum units with differing amounts of whole group instruction versus group work. They assessed how well they could justify opinions on moral assignments after the two types of instruction. The research design was quantitative. They use a control group to experiment with. They introduce new variables through training teachers in the program.

Schuitema et. Al. (2009) used a quasi-experimental design for the study. They used two experimental conditions and one control condition. The participants in this study were 482 eighth grade students. The researchers investigated an indirect approach to instruct students on citizenship values (one that allows for students to create dialogue to decide on their own what values and beliefs they will have). They included a pretest and three dependent variables in the research design. They had three conditions, one control and two experimental; all conditions used the same textbook. They invited 37 teachers to participate and randomly assigned them to control and experiment groups. Teachers in the experiment groups were given training on how to implement dialogue in group work.

The instructional methods of the two experimental group used a history textbook that had been used in the current curriculum. The researchers then supplemented the textbook with a teachers' manual and workbooks for the students. The main topic studied the first colonists to the early twentieth century in the USA. It closely examined: (a) Native Americans, (b) immigration to the USA, (c) slavery and the Civil War. The researchers designed two unit plans along with a prominent textbook author for students in the eighth grade. The units were tested in a pilot study with two experienced teachers. Both teachers taught two different classes. Feedback from students and teachers were taken into consideration and the units were then further refined. The units closely defined moral values and taught students to be able to recognize moral values in text. They also investigated their own values and their fellow students. Students investigated multiple perspectives on moral values through texts. Both units trained the skills and attitudes students needed to participate in constructive dialogue. They were instructed to investigate points of agreement and disagreement and then indicate the values that they were using to make that judgment.

The two curriculum units were taught differently. One involved the students engaging in dialogue in small groups of students without teacher guidance while in the other, dialogue generally took place in a whole class discussion under the teachers' guidance. The teachers' manual prescribed students to work 65% of the time in group work, and 15% of the time for whole class discussion in the small group work unit. Teachers were instructed to give as little guidance and help as possible with content materials but to explicitly guide the process of collaboration by helping the group as a whole only when asked for assistance. In the whole group unit, students were to spend 40% of the time in whole group discussions and 20% of the time for group work. Teachers were instructed to guide the whole class discussions by asking questions while ensuring that as many students as possible participated in the dialogue.

The researchers collected scores from a National test on academic aptitude. They held posttests after the lessons that required students to write two different essays. One essay covered content material, and the other aimed at measuring the transfer to more general domains. Both essays had students write a short introduction to a moral dilemma and a resulting statement. Students were required to consider the interests of Native Americans as opposed to the interests of the immigrants. The procedures for the two assignments were similar; they were given 10 minutes to discuss the statement in groups of four then write their opinions individually.

To ensure quality implementation of conditions, teachers were required to keep a daily log. Every activity in the log detailed: (a) how much the learning activity had been carried out compared with the teachers' manual and (b) how much total time was spent on the activity. The researchers concluded that the activities were implemented accurately as outlined in the teachers manual. The two conditions differed markedly in the amount of group work and whole class time spent in discussion.

The researchers used independent raters, randomly selected, to assess the student essays on moral values and multiple perspectives. The moral values assessment took into account two features of the text: (a) the number of arguments referring to a moral value and (b) the extent to which the students explicitly referred to a moral value. The more clearly a student referred to a general value, the higher the score. The multiple perspectives variable examined the extent to which students discuss various perspectives in their essays. They assessed the amount of perspectives and the degree of elaboration on the perspectives. The number of arguments and sub-arguments for each perspective was checked. The higher number of arguments and perspectives, the higher the score. Each essay was scored twice. The scores were then averaged for each essay.

The analysis of the essays included three levels: (a) student, (b) group and (c) class. The assessment of the essays resulted in four different scores: (a) values, (b) multiple perspectives, (c) historical reasoning in the subject matter, and (d) multiple perspectives in the transfer assignment. These five scores represent dependent variables. In the analysis, the students were placed into a high-track (high achieving), mid-track and low-track. The high-track students performed significantly better in the whole group discussion compared to the low-track students. The control group did not show a significant difference between student groups. The results also showed that all students who participated in a curriculum for citizenship education used more moral values and were better able to discuss multiple perspectives when justifying their opinions on moral issues than students who followed the regular history lesson. It also showed that moral values and multiple perspectives using a dialogic teaching approach enhances students' abilities of awareness to the moral values and different perspectives that are embedded in the subject matter. Students were also more likely to justify their own viewpoints, suggesting transferability. It still remains unclear whether these results extend over

time. The study further demonstrated that students in a low and mid-track better benefitted from a group work teaching method to justify an opinion rather than whole-class teaching. Students who did relatively a lot of work in small groups referred to values in their essays more often and more explicitly and were better able to validate different perspectives compared to students who had done more work in whole-class situations. Lastly, students in a mid- and low-track showed no improvement when paying attention to values and multiple perspectives in order to justify their opinion.

I would like to learn more about some of the methods they used to integrate democratic attitudes in students. It does not discuss how the teachers were chosen. It is unclear whether this had an effect on the conclusions or not. I hope to use similar methods to influence my own classroom curriculum. Even though it focuses mainly on history, I believe the practices can be stretched out into other subjects as well. The indirect approach to teaching students about moral issues is one that I am interested in using in my own classroom strategies. These findings can be generalized since they used such a high amount of participants. They also have a control group and a pretest to define the knowledge the students had before they received the treatment. The observations and findings are convincing because the research methods were sound as they used a control group and experimented and refined the curriculum before implementing it in the class. I believe that these findings can be stretched out to other subjects as well because of the importance of using dialogue for constructing arguments. I believe what I'm seeing is a predictable event because I have seen this dialogue and group work used in other subjects with similar results.

**Students' awareness of school rules lead to more academic achievement.** Thornberg (2007) found that students think many school rules are good. The students identified that adults are the ones who make school rules and enforce them. This was consistent with the researchers' observations. They found that when school rules are unexplained, unfair, and ambiguous, students were more likely to be cynical. The findings also report that students indeed are active agents in their socialization process. It was identified that children's grades and success in school was dependent on the adoption of the school culture. The researcher also discussed the enforcement of implicit school rules as being a problem area for teachers and students. Since these school rules are not explicitly stated, students are not able to grapple, identify and reason with these school rules. They are a hidden force teachers unevenly impose. The study also identified implicit school rules as being unevenly enforced. This further confuses students as to how they should interact in the classroom when coming from a differing background as the school. This leads some students to be frequent offenders and does not allow for them to learn how to act in the educational environment. Viewing multiple samplings, he concluded that the use of implicit rules and the inconsistencies in enforcement make it difficult for teachers and students alike.

Thornberg (2007) is seeking to give a voice to students about what they think in regards to school rules and their teachers' behavior. He sought out the effects of school rules explicitly stated by the teachers and other adults versus rules that are implied in the school environment. He wanted to know which approach to school rules are followed more readily. This qualitative study examines using these two rule approaches in two different schools in Sweden. He uses an ethnographic study to assess student attitudes towards adults and school rules.

This study focuses on students in two different schools in mid-sized towns in Sweden. It does not identify how these two schools were chosen or how the classes were chosen. Two pre-school (age 6), two second grade (age 8), and two classes in grade 5 (age 11) were used in the study. In total,

there were 141 student participants and 13 teacher participants in this study. They used participant observations, audio recordings and interviews done by the author (he de-emphasized his role as an adult by avoiding the role of a person that gets after the students, just observes). The interviews were conducted with groups of 2-4 students. They interviewed 139 students in total. The interviews consisted of students making meaning of school rules, teachers' discipline and valuing school in general. A qualitative content analysis was conducted during and after the fieldwork. The data from interviews was compared to other data gathered through student behavior records, self-reports and interviews. Teachers were also interviewed to assess their beliefs surrounding: (a) everyday values; (b) school discipline; and (c) everyday practice.

This study is transferable to my future classroom because it studies different grade levels in an elementary school. The study also exemplifies the importance of being consistent with the implementation of school rules. It identifies research similar to the results of the study and which are aligned with the research findings. The authors included what the schools did to influence student attitudes and beliefs. This study is a reliable in-depth qualitative study as it has research included involving why they were doing this study.

If the methods section included how the researcher chose the students and school in general it would clarify it. Also, if the study showed the research questions and interview protocols, it would have clarified the procedures as well. I wonder how this researcher was able to interview students without skewing the perspective of the students with his beliefs. I also wonder about how he evaluated and interpreted the data collected from the students.

This study is very specific to what Thornberg (2007) is focusing on. The focus on the two different perspectives of rules and the effects it has on elementary student attitudes and achievements is useful to my future classroom. I hope to be able to take some of the positive attributes such as: (a) identifying implicit school rules; and (b) providing a space to discuss these rules to impart more positive experiences on my future students. This may allow all students to have the chance at academic achievement.

**Teachers modeling engagement and interest in subject matter helps students feel more engaged and interested.** Wentzel (2002) found that four motivational outcomes were significantly and positively related to: (a) teacher motivation; (b) fairness; (c) rule setting; and (d) high expectations. They were also negatively related to negative feedback. This means that for students to be motivated in classrooms, it seems necessary for them to be in a positive environment where high expectations, fairness and setting of rules is in place. There were no variables that were covariant. It was further shown that negative feedback has a negative effect on classroom behavior. High expectations on the other hand, predicted prosocial goal pursuit. Classroom grades are also positively affected by high expectations.

The results of the questionnaire further showed that student grades were not dependent on mastery of goal orientations. The results pointed to teachers as playing a significant role in the success of students. Attitudes toward teachers were shown to be a result of the socialization contexts the teachers set up in the classroom. A classroom which frequently utilized negative feedback had negative responses from the students seeking prosocial behavior. Elementary school teachers specifically are able to develop a stronger sense of community and display socially competent behavior resulting in academic gains when their teachers are trained to provide students with: (a) warmth and support; (b) clear expectations for behavior; and (c) developmentally appropriate autonomy. Overall, most students identified teachers as displaying caring attitudes towards them.

These positive beliefs from the students seemed to lead to a higher level of engagement and interest in the material. This study displays the need for a nurturing environment where the students' ideas and values are taken into account.

Wentzel (2002) wanted to further research in childhood development by looking at the effect parent-child relationships have on students entering the classroom. Wentzel examined whether student motivation was affected by characteristics of teachers that reflect effective caregiving. The researcher also examined the relation between students' motivation to achieve and modeling of interest in subject matter by the teacher. Lastly, the researcher is seeking to further her understanding of adolescents by mainly focusing on middle school aged students rather than on the teachers.

Wentzel designed a quantitative study. This quantitative study used a questionnaire administered in one setting. The questionnaire use a 1-6 scale to answer the questions from 1 being *very strong*, 2 *strong*, 3 *somewhat strong*, 4 *somewhat weak*, 5 *weak*, to 6 *very weak*. They administered the questionnaire to students in the sixth grade in two different middle schools. It was not discussed how the schools were chosen. No experimental variables were introduced. The researcher examined the schooling system that was currently in place and used differences in how students saw their teachers as a way to examine their variables. They measured: (a) background information; (b) social goal pursuit; (c) interest in class; (d) control beliefs; (e) classroom behavior; (f) academic performance; and (g) five different teaching dimensions. Of the teaching dimensions they assessed: (a) rule setting; (b) negative feedback; (c) high expectations; and (d) fairness (democratic communication). These different dimensions were compared to the students' gender and race.

The researcher found that school effects were not significant for all teaching dimensions. Of the teaching dimensions mentioned above, five of the seven were significant to student outcomes. In School A, more frequent pursuit of social goals and stronger interest in class related positively to students nominating classmates as being prosocial more often than did students in School B. Teachers in School B rated their students as being more irresponsible than did teachers in School A. The questionnaire also demonstrated consistent student perceptions of their teachers.

This study presents a conclusion that generally follows research. I do see a major flaw though in that it only uses a one-time administration of a questionnaire. Many times when people are taking questionnaires, especially over a long period of time, they get may bored and may not accurately fill it out. It also seems problematic to not use any variables or experiment in any way. It could just be a fluke that these two schools had these outcomes. The researcher also does not discuss how they chose the schools or the grade levels. Though the results were often shown to be statistically significant, this study does present some flaws in the design.

This study drew attention to the need for teachers to model engaged behavior and display a level of caring and support for students. This is important to classroom management as many times when a student acts out, it is due to lack of engagement. This study highlighted the importance of modeling engagement for the students as a way to encourage students to engage in the material. It also demonstrated the harmful effects of constant negative feedback on the students' success in the classroom as well as overall academic performance. I will definitely keep these two findings in mind when in my own classroom.

**Summary and implications.** Though each study looked at different research questions, the studies presented related information regarding different aspects of democracy in the classroom. They showed that a democratic structure for classroom management does: (a) encourage positive attitudes

towards learning; (b) following the rules; (c) higher levels of engagement; and (d) collaboration. Though this alone will not allow for higher levels of achievement, it does create a positive attitude toward learning in the student. Though not explicitly studied, I believe a positive attitude will lead to a better learning environment for all students.

Classroom and school environments where rules are made collaboratively with students were shown to have more positive attitudes toward learning and better implementation of school rules, with less students acting outside of the school rules (Thornberg, 2007). Students generally think many school rules are good when properly explained and understood. The students generally felt that when adults made school rules that are unexplained, unfair, and ambiguous, students were more likely to be cynical and act out against those school rules. Rules are generally thought to represent values and ideals held. They help to socialize students to become participants in the real world. The findings also report that students indeed are active agents in their socialization process and as such, should be involved in the rulemaking process (Thornberg, 2007). It was identified that children's grades and success in school was dependent on the adoption of the school culture.

Wentzel (2002) also discussed the importance of collaborating with students on school rules since a major part of the students' motivation lies in their perception of fairness. When students are included in the environment and shown a level of fairness, they are better able to learn. Wentzel (2002) also discussed the enforcement of implicit school rules as being a problem area for teachers and students. Since these school rules are not explicitly stated, students are not able to work with, identify and reason with these school rules. They are a hidden force teachers sometimes carry out. This further confuses students as to how they should interact in the classroom when coming from a dissimilar background as the school. This leads some students to be frequent offenders and does not allow for them to learn how to act in the educational environment. The use of implicit rules and the inconsistencies in enforcement make it difficult for teachers and students alike (Wentzel, 2002).

Students' ability to grapple with a concept and decide on a value was shown to be very important in two of the studies. Choice is a key variable between student-centered and skills based (Davis, 2010). This study's data suggests that a student's ability to choose, positively affects their attitudes toward reading and that students are cognitively aware of this effect. Davis (2010) concluded that the ability to make choices surrounding reading increases the autonomy of the reader by utilizing their background knowledge and develops self-direction in choosing reading activities. These all lead to a more independent learner and fosters lifelong learning attitudes in students. The data also suggests higher engagement levels in students, allowing for better classroom management where students are active participants in their education .

Collaboration among peers, another dimension of democracy, was also shown to positively affect engagement. The data points to collaboration as a meaningful element in positively affecting children's experiences in literacy (Davis, 2010). It also reports a need for more modeling on effective collaboration. Challenge is the level of difficulty of a certain task. Davis noticed that when the students were in a small group setting, students were much more positive about the experiences and opportunities for success. When challenge and collaboration were presented together, there were more positive attitudes towards learning.

I will use the research in my future classroom by keeping in mind that engagement and motivation were major factors in classroom management. I will strive to use the most engaging materials while modeling interest in the lesson myself. The studies suggested choice and collaboration as major factors in student motivation and engagement. By creating space for

collaboration and choice wherever possible, I hope to encourage students to become more engaged and interested in the lessons. Students should be active agents in their education through being able to make choices about their education. A democratic approach in and of itself may not close the achievement gap, but it will foster better attitudes towards learning.

Further areas of research I am interested in after reading this research are the effects of different teaching styles on different levels of socioeconomic statuses of the students. This research also made me curious on the research surrounding students' funds of knowledge and how respect for the students' background can positively affect the students' successes in school. To directly relate to my research question, I find it important to seek out classroom management plans based on student choice and teachers as facilitators in the learning process.

I am still unclear on what effects engagement and interest in the lessons have on student achievement. Further research will focus on the effects of more engagement and interest on student achievement. I will also research the effects student choice and collaboration have on student achievement. Student choice and collaboration seem to have a positive effect on levels of engagement and motivation, this leads me to believe that there would be greater gains in academic knowledge in the long run but I have not seen this in the research previously mentioned.

### **Exploring Disaffection of Democratic Classroom**

*by Christopher Patwardhan Foes*

I researched areas surrounding democratic and student-centered classrooms that would answer the question "What can Democratic Classrooms offer to students and teachers?" My focus relates and supports our greater research focus by discussing the indirect effects of a democratic classroom on the students and teachers involved, with a particular emphasis on the major problems afflicting the education system today. To find my research I searched the electronic research article databases of Science Direct, Ebscohost, JStor, Google Scholar, and ERIC. Some of the terms I used were combinations of *democratic education*, *dropout*, *student-centered*, *student-directed*, *teacher-centered*, *teacher-directed*, *burnout*, and *turnover*. Although I found many studies talking about student-directed classrooms and burnout, dropout, and turnover rates individually, in my limited search I was unable to find many articles that compared the variables. The research I found discussed the possible pitfalls of student-directed learning in relation to: (a) knowledge gain; (b) the impact of student-centered teaching strategies on long distance learners; (c) the impact teacher-centered strategies on burnout levels; (d) the causes for teacher burnout; and (e) the perceptions of students about the importance of student-centered and teacher-centered practices in their education.

During my student teaching I felt that my role in the classroom was too absolute. The model I was provided from my host teacher was a highly teacher-centered classroom modality that relied heavily on bending students to the strong will of the teacher. While this setup worked fine for the majority of the students, it was highly likely to leave specific types of students along the wayside. As these students continued to be less served by the classroom environment they became more alienated from the content and their education. My solution was to spend as much one-on-one interaction time with the students who were not being served by the classroom system I taught within. While this worked with the students I was able to interact with, I found myself not able to split up my face time in an efficient manner and I have since become interested in alternative teaching styles to a teacher-centered classroom.

From this experience I have gained interest in alternate ways of teaching and running a classroom which can thrive in a traditional public school but can meet the needs of my students without creating a specific individual burden on individual interaction. In a 54 min classroom of 33 students, a teacher would only be able spend less than two minutes with each student. This is not a tenable method of attending to the needs of students, and would lead to a very short lived teaching career filled with angst and stress. Because of this I am exploring democratic classrooms, also dubbed student-directed classrooms. This method is student-centered, instead of the teacher-centered model in which I previously worked. Student-centered learning means that the classroom routines, content and environment are based on the needs and interests of the student instead of being simply at the decision will, and whim of the teacher. This method is intended to put the student in the role of an active engage learner who is able to explore their interests in an autonomous manner.

Through my research I hope to answer two specific questions: (a) can student-directed learning in the classroom help my students and me from becoming alienated from the education system?; and (b) How effective is student-centered learning when compared to traditional, teacher-centered learning?

Through this research I hope to be able to better serve my students who are at risk of becoming, or are already disaffected from their education. Democratic education may allow students to craft the classroom into using their cultural framework, which has been shown to better engage and produce better student outcomes (Rogoff, 2003). As a new teacher I am not only interested in the direct education and wellbeing of my students but also in the extremely high turnover rate of teachers, with the National Education Association claiming that about 50% of new teachers leaving teaching within their first five years. If I have such a high likelihood of leaving the profession in the next five years, I think it would be in the best interests of my students and me to employ preventative measures to combat this issue.

#### **Comparing knowledge gain in student-directed to teacher-directed learning groups.**

Ibrahim et al. (2006) conducted a quantitative study, randomized, experimental trial with a stated goal to see if there is a statistically significant difference in knowledge gain between structured and *student-directed*. The definition for structured learning coincides with the definition of *teacher-centered*, in that the structure was completely defined by the instructors. Student-directed meant that students were given a flexibility of scheduling, and picked from a menu of workshops to engage in that would meet their various needs. The knowledge gain was measured by a pre and posttest that measured the students' knowledge on the 10 most common referrals to the schools' pediatric center.

This study had a sample of 138 fourth year medical students at the University of Dundee in Scotland, and created randomly assigned groups of 12-14 students. These students had a history of both student-directed and structured modes of learning for their duration of the course. The group would then be randomly assigned to either student-directed learning, or structured learning and were then compared along the same evaluation at the end of the two week instructional period. The Structured group attended pre-determined lectures along a pre-determined timetable with no allowed flexibility. The student-directed group were given choices on what clinics they chose to attend as long as they attended enough clinics over the same period. At the end of the period both groups took the same test and were charted by an increase over their pretest.

This shows a significant increase in knowledge gain of the structured learners when compared to the student-directed learners. The structured learners' knowledge gain was on average

higher than the student-directed by over 55%. The study found no significant difference between males and females.

These students had been exposed to both styles of learning procedures before in their medical program prior to the beginning of the study. This should help alleviate the novelty effect or any initial confusion from starting a new procedure that could affect the outcomes either positively or negatively. The staff who administered the intervention and the assessments were blinded to the groupings, to prevent favoring a specific outcome. The protocol was reviewed by outside administrators for possible ethical breaches, of which none were found. The researchers also state they have no conflict of interest in the study. The only possible threat to the generalizability of the study is due to the issue of only testing one year's class. The results may not be applicable to cohorts of other years, due to historical or other considerations. However, the results were significant and the researchers showed a high degree of introspection in order to maintain high standards.

The study shows very strong protocols to preserve internal validity; with effort put in to prevent testing bias due to the pretest, randomized sample methods, 100% of the population was sampled, and the researchers asked for outside verification of their protocols.

The study's use of a randomized experimental trial and the specific endeavors of the researchers to prevent contamination, researcher bias, and other issues leads to a very strong internal validation of the results. The study's generalizability suffers from a lack of a thick description of the sample, but through the randomization across the sampling, this issue is lessened significantly. The largest issue between the sample found within this study and my classroom is the difference from maturity and outlook on education. Since all members of the study are voluntary students in a medical program, a high personal educational rigor can be expected from them. Since my students will not be voluntary but will be legally required to submit to their education, they may have issues not visible in this study. Regardless of these downfalls, I believe this study has many applications for my classroom.

This research brings up a cautionary tale for student-directed learning strategies. Because student-directed learning strategies may not lead to increased knowledge gain when compared to traditional teacher structured learning, the use for student-directed learning must be found in other areas if it is to show value.

With evidence from Ibrahim et al. (2006) showing that the value of student-directed learning may not come from improving knowledge gain, what are the possible areas for student-directed learning to show its strengths? In order to investigate the practice fully we cannot simply engage one facet of it. Teaching strategies affect many areas in the classroom from management, engagement and possibly even to health.

**Student-centered learning and distance learners.** Hannun et al. (2008) used a double-blind cluster-randomized quantitative study to investigate the use of learning-centered education upon a specific population of students who have traditionally shown lower rates of course completion. This research studies the efficacy of *student-centered* learning practices in distance education courses with 36 pairs of schools and 246 students from the USA. The population was every distance education program in the USA, with the definition of distance education being an asynchronous online course. The students would sign into the course management system through a local school to take the class online. The students were taking an AP English Literature course, which means they were high performing students. The study employed an experimental design by having the local facilitators of the students split into two groups; a control who received no instruction and the experimental group

who received instruction on learner-centered methods. Other similar studies have shown up to 50-70% of students in these courses do not finish their online course or program, and this study was designed to test a possible solution to this problem.

The study selected its participating schools from every rural school in the USA through the National Center for Educational Statistics database. Because of this sampling technique, the research findings from this study are generalizable to the whole population of USA rural students, the sample will likely be very representative of the population of rural students in distance education programs. The control and experimental schools were chosen and paired along matching characteristics, and then the classrooms themselves were altered to keep variables such as the student to teacher ratio similar.

The investigation and analysis of the data shows that the students under learning centered trained educators had a statistically significant difference when compared to the control group. Students in the learner-centered class stayed in the course for longer, and were more likely to pass the course.

The researchers state that “Generalizing beyond this population is not appropriate” (Hannum et al., 2008). And while I agree that these result cannot be directly applied into another setting, I do believe that the results still lend credence to the idea that learner-centered learning strategies can benefit students. The research was only conducted over one semester, and the results could vary over a longer period.

I will use this study to show the effects of student-centered learning in preventing disaffectation of students who have low rates of course completion. Because this learner-centered treatment was effective at reducing student dropout, I can use this as evidence to support the idea that the treatment may prevent dropout in my future classroom. Although I must be wary of the application beyond rural secondary schools, I believe the evidence is overall positive to the utility of learner-centered principles. Another issue is the type of course that was chosen. AP courses are optional, and therefore all of the students in this study have volunteered for a more difficult course, which makes them more likely to participate more fully in their work.

While the data may only be applicable to a smaller, more specific population of students, it does begin to build a basis for the possible strengths of student-centered learning strategies. As student-centered learning strategies can show a positive impact on student completion of a course, the impact on teachers must also be inspected.

**Student control ideology and burnout.** Bas (2011) conducted a quantitative study which intended to discover and analyze any correlation between a teacher’s Student Control Ideology Scale rank (a scale that ranges from *teacher-centered* to *student-centered*) and their level of burnout as defined by their Maslach Burnout Inventory. The inventory focuses on levels of exhaustion, inefficiency and cynicism and is a highly studied measurement of burnout in professional research. The research looked at the correlation between elementary school teachers’ student control ideologies and burnout levels. There are two guiding questions posed by the researcher; (a) Is there a significant correlation between teachers’ student control ideologies and their burnout levels?; and (b) What is the predictive level of teachers’ student control ideologies for their burnout levels?

The researcher used a correlative investigation model. The research studied a sample of 376 Turkish teachers from 12 schools from a population of 798 total elementary teachers from the region. The sample strategy was one of purposeful sampling, as the researcher chose participants to be representative of three different socioeconomic levels present in the region. The teachers were

directed to take two different surveys, and the data from the two was analyzed for any correlation or predictive qualities along the variables.

The research shows a significant negative correlation between teacher control ideology and all three factors in the Maslach Burnout Inventory, emotional exhaustion, reduced feeling of personal accomplishment, and depersonalization. This means that the more teacher-centered a classroom is as measured by the Student Control Ideology Scale, the more the teacher experiences burnout as measured by Maslach Burnout Inventory. Of the three burnout variables, reduced personal accomplishment was the least correlated while the other two factors showed almost equal levels of correlation. The data also shows a significant predictive ability of a teacher's perceived burnout level from their student control ideology as seen through a simple regression analysis. The researcher comes to the conclusion that there is a 99% confidence level that 17% of the total variance for teachers' burnout is explainable by their student control ideology.

This research concurs with previous research that looked at levels of teacher-centeredness in the classroom with the three factors of burnout in the Maslach Burnout Inventory. The research does not self-reflect on its generalizability, but as it samples a large amount of its population and has no need for randomized groupings, the data from the research is less susceptible to common shortcomings that would affect its generalizability. The one area that would hurt its generalizability is the unclear method of sampling. Although the researcher has a sample that is 47% of the total population of 798, the participants were volunteers. The researcher does put effort in constructing a sample that represents three different socioeconomic groups, but never discusses if the conclusions were the same across them or not. If the participants knew beforehand what the researcher topic was then they may have self-selected for teachers who were experiencing higher levels of burnout which would affect the internal validity of the study. Although the sample was elementary teachers, I believe the data can be generalized to my future classroom because the research focused on the teacher's views and opinions on how the class is to be run and what sort of position a teacher should have within the classroom. In this framework the level of the students has little sway over the results of the surveys.

In my own work I will use this study as evidence that shows that teacher-centered classrooms can be a factor in teacher burnout. This will clarify my ability to see the positive and negative effects of leading either a teacher-centered or student-centered classroom.

Student-centered learning, as measured by the Student Control Ideology Scale helps create an environment that prevents teachers from experiencing burnout. This research led me to further question what affects teacher burnout and how does it affect teachers differently.

**What does teacher burnout look like?** Hulltell et al. (2013) created a longitudinal quantitative study to explore what relationships, if any, are there between new teacher burnout and a plethora of variables that have been classically seen as correlational. The study's population is based in a Sweden, with the data originating from a study of teachers' health whose data was collected via questionnaires. The sample begun with 2,853 participants and ended with 816 valid data points. This is due to a high dropout rate as well as participants not fully answering surveys. The total population was 4,067. Of the 816 participants who finished the study, 85% were female with a mean age of 35 years. The study focused its measurement of participants along two specific variables, teacher self-efficacy (TSE) and self-rated health (SRH) and used these to measure correlation to burnout as assessed by the Scale of Work Engagement and Burnout (SWEBO).

Because the population is Swedish and there was a ~75% drop out rate, there could be some important hindrances to making this study applicable to my needs. However through the careful methodology and clear sampling techniques I believe that the dropout rate did not affect the validity of the study. The study employed attrition analysis which is intended to see if the dropout from teachers was a systematic process. It found that there was no relation for any of the variables tested and the dropout rate from the study except time, sex and SRH. As the time increased so did the dropout rate, men were more likely to drop out than women, and participants with lower reported health were more likely to drop out than healthy participants.

The study surveyed the participants five times, twice during their preservice education and three times over their first 3.5 years of teaching. While the researchers were most interested in SRH and TSE in relation to the SWEBO, they also measured for depression, life satisfaction, achievement of educational goals, satisfaction with education, pressure from studies, pressure from occupation, and spillover from studies to family. TSE was rated along an 11 point continuum that asks participants to rate themselves about their teaching beliefs. A lower TSE means teachers had reported less confidence in their ability as a teacher along the various points, many of which are related to *student-centered* learning. SRH was rated from high to low, where low indicates poor health.

The participants were then put into different clusters based on shared features. Cluster 1 initially had low levels of burnout, and showed a significant increase in burnout which was reflected in an increase in turnover intention, and decreases in SRH and TSE. Cluster 2 was younger than the average, initially had higher levels of burnout which had a minor decrease over time, which was not statistically significant. They also showed higher levels of depression and pressure related to their studies, and lower levels of life satisfaction and TSE. Cluster 3, which was older than the average age, went from low levels of burnout which increased and then decreased over the course of the study. This was positively correlated with turnover intention and negatively correlated with SRH. Cluster 4 had a larger male population and higher levels of depression. They had high levels of burnout which initially dropped but then increased a significant amount by the end of the study. These changes were negatively correlated with both SRH and TSE. Cluster 5 began and finished with low levels of burnout and turnover intentions. They also kept high levels of SRH and TSE. Cluster 6 began and finished with high levels of burnout with no significant change, and low TSE and SRH through the study as well. Cluster 7 began and ended with moderate levels of burnout but had a large significant drop in TSE, and a minor significant drop in SRH.

These results tell us that while overall the of burnout are significantly, negatively correlated with TSE (ie participants who report they are inefficient teachers have higher levels of burnout) and SRH (ie participants report they are unhealthy have higher levels of burnout), when broken down into specific clusters based on similarities, that different trajectories of burnout levels can be traced.

The researchers are not focused on the generalizability of the study, and are instead trying to look to break down a previously studied correlation by different factors to see how subgroups of a sample relate differently to the variables. The sample is one cohort of teachers from 21 schools throughout Sweden, which would be a varied and representation of new Swedish teachers. However since the entire sample went through their preservice education at the same time, the prevalent forces of the time will affect them all and therefore not be controlled. This means that the results may not be generalizable to populations who come before or after or from other countries.

The only threat to validity found in the study is the limited scope of the sample, being only one year's cohort of educators and having such a large drop off. Historical issues could have

promoted better, or worse, health in the cohort which could affect the levels of burnout or cause false correlation. However, other research supports the findings found in this study, and the study employed specific data analysis to observe for corrupting factors. Therefore I feel confident in the study's internal validity.

This study compares the important variables that were affected by student-centered education to see if they will be improved and therefore improve teacher burnout levels. The study was focused on what causes dropout, with the variable I am most focused on in relation to burnout being TSE. The study defines TSE as "TSE generally concerns classroom practices and common aspects covered in assessments of TSE are organizing and planning, student engagement, instruction, and classroom management" (Hulltell et al., 2013, p. 77). TSE can therefore be related to student-centered learning, but due to the lack of the specific questionnaire posed to the participants, we cannot know how the TSE measured student-centered or student-directed philosophy in the classroom. Because of this, we can only use this study to frame teacher burnout using the variables of self-reported health, life satisfaction, achievement of educational outcomes, and organizational pressures.

**The coexistence of student-centered and teacher-centered learning.** Elen et al. (2007) created a series of 3 qualitative studies based on surveys that began by trying to elicit the beliefs of students on what makes an ideal university. As these researchers performed more studies they began to narrow their focus until they were trying to uncover the beliefs that students had about whether an ideal school should be *teacher-directed* or *student-directed*.

Elen et al. (2007) describe two initial studies that the researchers performed previously as well as an original third study. The two initial studies are seen as laying the groundwork for a third study that is more focused and able to answer the research question of student perception of the relationship between student-centered and teacher-centered learning.

In the first study Elen et al. (1998) surveyed 162 students from two different Belgian universities. The survey asked students to rate three fictitious universities that had different philosophies of education: (a) a problem based school; (b) a technology oriented school; and (c) a lecture based theory oriented school. Each school was given a short description and participants rated them along a 5 point scale of 20 statements. The results show that students ranked the lecture based school lower along independence of students, application of knowledge, and deep understanding as compared to the other two universities. This exploratory study does show that students see lecture based teacher-centered learning as not independent from student-centered learning.

The lack of description of the sampling method in the first study do not allow for generalizability, as the sample is too specific and not randomized. While the results were significant, the internal validity of the study cannot be verified and therefore the results of the study can be characterized as exploratory. However the study does present the idea that student-centered and teacher-centered teaching practices are not oppositional and perhaps can work in tandem.

The second study was completed a year later and included 414 second year higher education students from four Belgian institutions (Elen et Al. 1999). The participants completed a survey that had them describing higher education along two scales: (a) institutional support; and (b) encouraging independent learning. The survey asked the participants to rate the importance of 20 different goals for higher education. The results show that students find that both teacher centric and student centric ideals are valued and expected to work side by side in an idealized educational institution. The students see teacher learning and student-centered learning as two independent dimensions that are both favored in an ideal learning environment.

Again, the research lacks a description of the sampling method, which prevents generalizability and has a potential effect on internal validity. However through a more focused survey and a larger and more varied sample size, the results carry more weight. Regardless I would not be comfortable relying on this study for anything other than in an exploratory context.

The final and original study completed used a sample of 2,132 Belgian higher education students who took a 41 item questionnaire which is intended to uncover opinions on the importance of various practices in education. The practices are student-directed learning environment, challenging learning environment, differentiating learning environment, co-designed learning environment, intensive practice and teacher-centred learning environment. Interestingly it found that the students believed teacher-centered and student-directed learning environments were not mutually exclusive, and were both features of a high quality education.

The final study also suffers from a lack of transparency in its methodology, therefore neither internal validity nor generalizability can be claimed of the study. As a result, the study's findings can only show a possible relationship between the variables, but cannot show a correlation. However, the final study's sample size is much larger than the previous studies, and the research question and design are much more aligned, which creates a positive trend towards useful research that the authors are moving towards.

While the research presented cannot be relied upon to be valid, it does pose an interesting question, are learner-centered and teacher-centered learning extremes of the same continuum? Or can they both be practiced simultaneously in a classroom?

**Summary and implications.** The research has shown that while *student-centered* learning, such as a *student-directed* classroom, may not improve knowledge gain for students, it does have other strengths for education. Specific populations of Students who participate in student-centered learning show lower levels of dropout and complete courses with more frequency. There is no evidence refuting the generalizability of this, but there is also no evidence showing its generalizability. I can therefore feel confident in experimenting with this strategy in my classroom while scrutinizing the practice for evidence of possible negative effects on my students. Research also shows a relationship between higher levels of burnout and *teacher-centered* classroom practices in an elementary school setting. This may help lower turnover rates among new teachers, and may generally lead to better emotional health for teachers due to a lower burnout rate. However any other connections between learning strategies and burnout cannot be made, but the levels of mental and physical health do show a strong impact on burnout levels. Lastly, we are given the suggestion by higher education students, that teacher and student-directed learning can coexist in the same classroom.

From Ibrahim et al (2006) there is evidence that teacher-directed learning leads to greater knowledge gain, which is strong evidence against the use of student-directed classroom strategies. The findings were that the students who scored worse on their assessment were the experimental student-directed group. These findings show that student-directed learning strategies possibly reduce student knowledge gain when compared to teacher-directed learning strategies.

Research done by Hannun et al. (2008) shows that distance learners had higher course completion rates from teachers who had been trained in student-centered learning strategies. While this finding is limited to distance learning in the US, the results show a possibility that students who are at a higher risk of dropping out of classes may benefit from student-centered learning strategies. On its own, this research would be insufficient in providing evidence for this claim, but paired with

the research of my colleagues which discussed increased engagement from students allows for a strong implication that student-centered learning would benefit other populations besides long distance learners (Davis, 2010).

When looking at the effects of a classroom that is run by a teacher who believes in student-centered learning, Bas (2011) found that teachers experience lower levels of burnout than their peers with teacher-centered learning beliefs. These results means that teachers who participate and believe in student-directed learning will likely be more satisfied with their work, be more positive in the classroom and less likely to quit.

The research done by Hulltell et al. (2013) attempts to show different variables and paths of educators that result in higher teacher burnout levels. This research shows that while a student-centered and teacher-centered learning philosophy of the teacher has an impact on the teacher's burnout level, that health and satisfaction levels are equally if not more important. This tempers the idea that democratic classes can prevent teacher burnout, but does still leave room for democratic classes as a positive factor in teacher burnout levels and therefore teacher retention levels.

The possible revelation that teacher and student-directed classrooms can coexist, and therefore teacher and student-centered classrooms, from Elen et al. (2007), means that there may be a hybridized classroom strategy that places the teacher as a facilitator to receive the benefits of both types of classroom strategies. Although it does not provide a framework in which to do so, there is a possibility of creating a classroom where students receive the benefits of student-directed learning in regards to better course completion, and teacher-directed learning in regards to greater knowledge gain. However this hypothesis is in need of further testing. In order to fully explore this possibility I will need to do further research into the hybridization of these two teaching strategies.

As I continue my professional practice as an educator I will begin both experimenting in creating democratic classrooms with high standards for myself as a central facilitator of the classroom. I will also further explore the research of classrooms that look to balance student and teacher-centered ideologies. Lastly, I will inspect and weigh the research that follows student-directed and student-centered classrooms. Employing the conventions of student-directed strategies in my classroom will need to be done with care, and I cannot expect the strategy to behave as it does in the research, which leads me to believe I will need to be vigilant.

Whether student-direct learning can truly help students, and what the mechanism is that does it, is a focus I will have in my future research. As the true impact of student-directed classrooms upon students disaffection is not yet fully understood through this research, further exploring this idea is important. It shows enough evidence to cautiously engage in experimentation, but the specifics about what to focus on within student-directed learning is unclear. I would also like to better understand what in structured learning leads to higher knowledge gains, and how I can replicate that in my practice regardless of my teaching strategy.

## **Conclusions and Discussion**

The strategies that are effective for building a *student-directed, democratic classroom* are shared decision making and student participation. Based on the research, there are a few basic understandings which will need to be realized in the classroom to set up a democratic learning environment effectively.

Teachers building democratic classrooms need to demonstrate democratic values and beliefs. The concept of shared decision making founded on organizational research practices promotes engagement, academic achievement, and behaviors. As students engage in shared decision making, they become more invested in their learning.

The research demonstrates that it is key for the instructor to act as facilitator and ensure students have access to long term goals and deep content knowledge that they otherwise could not obtain as self-directed novices. If student-directed discussion touches on academic concepts or content that will be relevant later in the year, it is the role of the teacher to make those connections explicit for students. A facilitator must provide the academic language and content awareness so students can access rigor and long-term planning. The research also demonstrates that styles of voting, the process and counting the votes affects students' ability to give honest or effective input.

The research surrounding whether a democratic approach also serves as an effective classroom management strategy revealed that a student-directed, collaborative learning environment leads to a more engaged and interested student. Though student interest was not linked to a higher performance in the class overall, it does lead to positive attitudes toward class content. A collaborative learning environment enabled students to be much more engaged in testing out their ideas surrounding a subject. The students' ability to collaborate also lead to a better ability to justify answers. Though the research does not explicitly state this, it seems to lead to the conclusion that with a more engaging learning environment, where students are more successfully completing work, classroom management will be positively affected.

Reviewing the uses for student-directed classrooms outside of student achievement is important as it has effects on the overall mental and emotional health of the teachers and students. This manifests itself as a prevention to burnout in teachers and in the completion rates, attitudes, and outcomes of students. Through the research present, we can see that student-directed learning will have a positive impact on teacher burnout, in which it will lower the overall level of burnout felt by teachers. Because student-directed learning is inherently student-centered, it will likely have a positive impact on students who are in situations where they have trouble completing their coursework. However, student-directed learning may not necessarily have a positive effect on student knowledge gains. The benefit, therefore, may be focused more on the social-emotional wellbeing of the students and teachers who participate.

Due to the limited nature of studies we were able to find, we cannot conclude that a democratic approach is better than a traditional approach to classroom management. Though a democratic approach did improve student engagement and interest, the studies were unable to conclude that a democratic approach leads to better student achievement through engagement.

When it comes to process; although studies about public and private voting were found and studies about student-directed and teacher-directed classrooms were found; we have not yet come across studies which deal with the causes, effect, or preferred methods of voting type and vote counting method in the classroom. We would have liked to have accessed studies dealing with fist of five voting compared to one person one vote, or winner take all voting compared to proportional representation but at this stage in the research, studies like this have eluded us.

From this review of the literature, we have collectively come to realize that it is important to be a strong facilitator in the democratic classroom. As teachers, we facilitate student learning by implementing achievable goals which allow students to collectively engage their zone of proximal development (Kozulin et al., 2003). The strengths of student-directed learning are the fostering of

student engagement, the wellbeing of both students and teacher, the promotion of skills the students will need in their future roles as citizens, and the creation of positive attitudes towards the content.

As four new teachers heading into our first year of teaching, we now plan to facilitate deep content knowledge through long term goals because self-directed students have shown to struggle with goal setting. We will use various democratic practices because they ensure equity and student input. Ensuring the effectiveness of student-directed learning will require us to provide strong guidance to our students. Through our use of these strategies we will be able to create positive student attitudes towards learning, with the opportunity of fostering life-long learners.

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# A Review of Transfer: Questions of Neuroscience, Diversity, Metacognition, & Assessment

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*Victoria Maratas, Claudia Marin, Amanda McGall, and Justine Valdez*

In this article, four teachers contemplated four questions related to the practice of teaching for transfer. These questions attended to transfer in the brain, for English Language Learners (ELL), metacognition, and assessment. Supporting transfer is important to us as future teachers because we want our students to be able to use the information and understandings we teach them in alternate contexts. Transfer is not an automatic process, so we must take steps to put into place practices that help our individual students transfer their understandings. We approached transfer through the use of literature reviews, encyclopedias, books, and in depth analyses of case studies related to our individual questions. As a result of our research, we found that the process of transfer involves cognition, emotion, and physical aspects. Additionally, we should attend to our student's dominant language in the case of English Language Learners. It was also found that students' metacognitive strategies allow learners to identify their level of readiness and next steps for transfer. Finally, to assess our students for transfer, we must create a variety of transfer questions which range from near to far transfer and test our students on these questions using pre-, post-, and delayed post-assessments. Our research has provided us evidence to base our practices on teaching for transfer; however, we still have more research to do around transfer's connection to differentiation.

**Keywords:** *transfer, teaching, assessment, brain, metacognition, English language learners*

The purpose of education is to prepare students for future success (McKeough, Lupart, & Marini (Eds.), 1995). Teaching for *transfer* is a method that we can utilize as teachers in public schools to support our students' thinking about the future applications of knowledge and understandings that are the current focus in our classrooms. With a general question around the optimal conditions that support transfer in the public school classroom, each of us are focusing more explicitly on research questions that help us answer our general question.

Our individual approaches as teachers, as well as the disciplines we teach, have shaped the individual questions we have chosen as we begin to look at teaching for transfer. While we acknowledge that there are many other questions still to be asked about transfer, we feel that our questions aid us in introductory approaches towards supporting transfer in our classrooms. Our research topics focus on functions conducive to transfer through an examination of transfer in the

brain, creating supports for transfer for our *English Language Learner's* (ELLs), the impact *metacognitive* strategies can have on life-long transfer, and how we can assess for transfer.

As educators and professionals work to enhance their student's knowledge and skills for learning, we feel it is necessary to understand what the biological brain needs and what conditions the brain utilizes to support growth in new learning (Nemirovsky, 2011; van Merrinboer et al., 2002; Zull, 2002). This research will support the group's focus on practices that best support transfer in the classroom by providing a more general view of how the brain works in conjunction with teacher practices that have the best chance of creating connections that facilitate transfer within the brain. This research will inform our background understandings as we take a closer look at transfer and students with multiple languages, developing self-monitoring and metacognitive skills, as well as having assessment focused on student awareness of what they understand and can apply.

Transfer is especially important for those students whose primary language is not English as there is an additional layer of processing and translation that needs to be attended to. This section of the research looks at how a large part of the knowledge and skills students are asked to either learn, refine or practice are embedded in the student's *first language* (Jiang, 2004; Duran et al., 2003). Transferring knowledge and concepts that are embedded in their first language is critical to support students' learning in the classroom. In order to support transfer in an ELL classroom, these types of *prior knowledge* in their native language need to be accessed intentionally and students need to be fully aware of what they know in order to apply it to different subjects and to different contexts. This is important because ELLs face a double challenge - they need to learn a second language and at the same time, they need to acquire knowledge about different subjects in the the language they are trying to learn. There are ways to make this thinking and translation more visible that involve giving ELL students skills that allow them to self-monitor and assessing in ways that connect to their primary language.

Students' self-monitoring and metacognition are pieces that come into play in both biological and socio-linguistic realms. With Bransford's (2000) definition of transfer in mind—the idea that someone has to transfer knowledge and skills to a new context means that the student has to recognize similarities and make connections to prior knowledge or understandings. Within this, there is a process that students are engaging that utilizes different types of thinking and understandings. While researching optimal conditions for transfer, student metacognition appeared as one of the types of thinking that create a way for students to identify and test strategies to prepare for new and future learning. There are powerful and interesting reasons to value the contributions metacognitive thinking brings to transfer that surfaces in the research reviewed. Some of these reasons include students' abilities to understand the purpose of what they are learning as a way to put it in alternate contexts, or encode the information, so that it can later be retrieved for future use. Another is relevancy to the learners' goals and the way that self-awareness as a learner can allow students to name what they know, what they still need to know, and what they think they know or won't learn. Metacognition can help students overcome barriers to transfer by giving them control over their learning in the form of identifying and defining what they know and need to understand in order to apply ideas across tasks, (Leat & Lin, 2003; Butterfield & Nelson, 1991; Scardamalia et al., 1984). These reasons and situations described are not the final assessment on the matter, but simply the limit of the research reviewed for the scope and size of this project and group question. Within the reviews and the connections made as teachers, ideas about self-monitoring, *schema*, memory, critical thinking and how the brain makes decisions were raised. However, in order to stay on track with the project's

purpose the focus is on identifying strategies that teachers can approach, think about and teach to support students' metacognitive skills to facilitate transfer and what is self-monitoring and self-assessment in the classroom.

Assessment places an emphasis on different aspects of knowledge and understanding that we hope our students retain for future use. As we compose our tests, if we do not measure how students are transferring information to alternate contexts or tasks, students cannot be expected to have this automatic awareness of how these new understandings are built upon prior understandings and how to apply them towards creating future understandings (Lohman, 1993). Transfer is not an automatic process (Bransford, 2000; Perkins & Salomon, 1988) and we need to be aware, through the use of pre-, post-, and delayed post-tests (McKeough, Lupart, & Marini, (Eds.), 1995; Moody, Abell, & Bausell, 1971; Schwartz & Martin, 2004) if *negative* or *positive transfer* is occurring when we ask our students to use their prior knowledge as a tool to understand and manipulate the understandings to become their own. As we begin to contemplate different methods to use to teach for transfer, we must also analyze the effectiveness of our techniques-although this is difficult to do as a teacher (as we do not have a control group), we must be metacognitive about how we might assess our own techniques. The goal in this subsection is to find out how we measure our students and our methods in their ability to transfer knowledge to make more flexible understandings about the world around them and how these understandings can be used to help them outside of the school setting.

From an egotistical point of view, our questions matter to us as teachers because we think that our work should have a positive impact on our students' lives. Students are not just in public schools so that they are kept out of trouble as they grow into adults, but we feel are there to learn from each other and from their teachers. This means that we, as teachers, should focus on preparing our students to apply their understandings outside of an academic setting. To take the perspective of our students, they too feel that they are in school so that they can be prepared for their future lives as adults outside school; however, many times, it is difficult for the student to see the purpose in what they are studying unless it is made explicit. Transfer itself can be tricky in that it is not always about what is being learned at present, but about what is being prepared for later on down the road. Being explicit with students about the learning that they are to engage in can have a meaningful impact on the students' abilities to recognize how their classroom learning can have broad applications for transfer across their life-long learning.

Transfer is situated both at the beginning and at the end of the *learning cycle*, and students begin *transferring inwards* as they take their prior understandings and interpret new inputs while our students end the learning cycle through *outward transfer* as they take their combined understandings and apply these to new situations (Schwartz & Martin, 2004; Zull, 2002). Transfer necessitates an awareness of both knowing what you know and being expectant of other connections to what you know (McKeough, et al., 1995; Zull, 2002). As a student, if you are made aware of the purpose of both the learning cycle and transfer, then it gives the student an advantage in that they know what to look for in their learning. They are then made aware of different avenues towards metacognition and the student begins to learn about how they learn. This awareness of who the student is as a human being and who they are as learners is an invaluable tool to provide our students for success in a world that will not always approach learning in the exact way that is suited to that particular individual.

Transfer has been involved in research around education for over five-hundred years (Montaigne & Frame, 2003). Transfer was considered just as important then as it is now, perhaps because one of the central aims of education, and in particular public education, is the desire to

support learning in new contexts relevant to the learning community's needs (Lohman, 1993). Learning for adaptation, finding the right resources, using the right structures and social interactions are all taught both in the student's environment and in their academic life. However, education, unlike the student's environment, does not usually teach to directly aid in community understandings and knowledge. This type of education will not be significant to the individual student unless they are made aware of the possible applications to other areas outside of the original context. Teachers teach in specific contexts within their discipline, but to teach for other contexts is the role of every teacher in order to facilitate learning that is student-centered, inclusive, as well as focused on empowering marginalized communities. To communicate and attend to their valued experiences and understandings that go beyond our initial classroom context is key to preparing the population for future learning and continuous self-assessment (Bransford et al., 2000) that creates purposeful and lasting effects in knowing what we know.

The current events that make this investigation into transfer relevant exist for both personal reasons, and reasons that inform our professional community. Big picture wise, there have been recent breakthroughs in brain examination techniques and new understandings are surfacing all the time. Approaching teaching from the brain and what we can understand about it means that we can teach to all students, because all students have a brain. The ability to start a conversation in that very real and non-judgmental realm can support students and teachers making sense of what is happening in learning and transfer experiences. In addition, student metacognition and critical thinking for and within the *Washington State Common Core* is being addressed in the conversations and the lesson plans of teachers. Metacognitive and critical thinking skills themselves are something that are transferable and need to be repurposed in different learning contexts across multiple disciplines. For us personally, we are going to be full-time teachers this fall and the reviewed research and our own work has applications within our future practices as reflective teachers.

It must be noted that there are some researchers who say that transfer doesn't occur, or that it happens so quickly that it is an undefinable moment for a learner (McKeough et al., 1995). One description states that "most explanations of transfer, or its absence, have used hypotheses about skill, knowledge, or understanding that participants have or have not learned and utilize or do not utilize in the transfer setting" (Greeno, 2006). *Far transfer* also proposes a problem because it is so much easier to have students practice and assess near transfer-as it is so similar to the original input. *Near transfer* is less dependent on prior knowledge and background than far transfer (Fuchs et al., 2002; Lohman, 1993). As far transfer is so much more dependent on the individual, it is difficult to teach, scaffold, apply in similar contexts, and assess. For our own purposes we are asking questions around teacher preparedness and strategies that make transfer possible. To answer these questions, we have to challenge our own assumptions, as well as the research we reviewed.

Our group first began investigating transfer as a topic after reviewing research for *interdisciplinary teaching*. Transfer, especially far transfer, was mentioned as being a key component towards making the argument for interdisciplinary curricula. After careful deliberation, our topic was changed as we felt that studying transfer would have more of an impact on our daily approaches to teaching. However, it must be taken into account that some of our initial research may have influenced our thinking and, because we found case studies on transfer before we did our broad research on our topic, we might not have obtained as broad a spectrum of studies around our individual subjects. This was especially true once we discovered the wide variety of definitions of types of transfer and the disagreement among scholars as to what transfer includes. Thus, many of the

articles required us to triangulate their study with the other studies. Our study is also limited in terms of case studies analyzed, which necessitates further research into the subject as we continue along our path as life-long learners. Also, although transfer is a commonly understood goal for teachers and students, it was difficult to obtain research whose samples were of students in middle or high schools (our prospective students), thus generalizing or transferring the results of our various studies around transfer was difficult.

<b>Type of Transfer</b>	<b>Characteristic</b>
<b>Transfer</b>	An active continuous process that involves prior learning and experiences affecting new areas of knowledge, or how one performs differently from the original context (Bransford, 2000; Greeno, J., 2006; McKeough, A., Lupart, J., & Marini, A. (Eds.), 1995; Nemirovsky, R., 2011).
<b>Positive</b>	Flexible use of knowledge and skills shown by using what one knows to good effect in new contexts/purposes (Butterfield & Nelson, 1989).
<b>Negative</b>	Experience with one set of events could hurt performance on related tasks (Bransford, 2000).
<b>Near</b>	Transfer from one school task to a highly similar task (Bransford, 2000).
<b>Far</b>	From academic subjects to vastly different contexts (Bransford, 2000).

### **Conditions that Support Transfer**

*by Justine Valdez*

My investigation looked at specific conditions that are optimal for transferring knowledge from one area of learning to another area. It is important to understand the kinds of learning experiences and conditions that lead to transfer so that educators can create many opportunities for transfer to happen (Bransford, 2000; Nemirovsky, 2011). My section will open up with the broader conditions that will support to prepare the exploration for how to foster transfer in the classroom overall. After closer analyzation of research it became apparent that transferring knowledge is not only a biological process in the brain. It is a complex synchronized process involving cognition, physical, and emotional feelings (Nemirovsky, 2011). Being aware of these conditions can better inform public school teachers practice by creating multiple opportunities for students to have educative experiences.

I realize in my own teaching experiences that students do not always make necessary or logical connections while attempting new learning tasks. Transferring knowledge has to do with utilizing prior knowledge and having the necessary conditions to be able to transfer to new situations (Chen, 1999; Jelsma & Pieters, 1989; Nemirovsky, 2011). In my teaching I have become interested in specific conditions the brain utilizes and needs for optimal transferring affect with new learning

tasks and problems. I would like to inform my personal growth and practice in knowing how to strategically plan so that my students maximize learning opportunities. This processes of learning and the transfer of learning is central to understanding how people develop areas of knowledge and awareness (Bransford, 2000). Therefore the more we understand as practitioners of how to create rich environments for learning, the more opportunities our students will have for making neuronal connections from past to present.

**Differentiation in new learning tasks.** The Jelsma and Pieters (1989) conducted a quantitative quasi-experimental study to determine the effects of *contextual interference* on the retention and transfer performance of *reflective* subjects and *impulsive* subjects. *Contextual interference* refers to interference of cognitive operations underlying goal-directed actions. Interference can be brought about by changing task demands across acquisition trade. Four different versions of a maze task were practiced either in a varied session or in an ordered session. Jelsma and Pieters (1989) hypothesized that on retention tests and transfer tests, (a)reflectives who practiced learning situations that depended on using reflection will move more quickly and will make fewer mistakes. Compared to reflectives who practiced in a well-structured learning situation not strongly calling on reflection, (b)impulsives who practiced in the random practiced schedule are expected to move more slowly. Impulsives are expected to make more errors than impulsive' who practiced in the blocked practice schedule.

Reflectivity-impulsivity (a type of cognitive style) was determined by the number of mistakes made and the time it took. *Reflectivity* refers to a speed-accuracy trade-off in the direction of accuracy, whereas *impulsivity* is associated with responding quickly and not taking the time to carefully select the correct solution. Impulsives were determined based on their response time and their number of mistakes. In short, the researchers categorized reflectives as those who made less errors because they reflected more on response alternatives, showed a more efficient use of attention, and made more efficient use of feedback information than impulsives.

They started with 47 right handed university students, 9 males and 38 females; the average age of the subjects was 20 years old. The participants in the experiment were getting course credit (possible extrinsic motivation). After the Matching Familiar Figures Test (MFFT), the total number of subjects decreased to 33. This was because they classified two different cognitive processing styles, and this is when the subjects were then broken down to two groups, either reflective or impulsive. Varied session schedule had 16 participants 10 reflectives and six impulsives. The ordered practice schedule had 17 subjects, 8 reflectives and 9 impulsives. Subjects were to trace complex geometrical patterns, called a 'meander' with a joystick-controlled cursor. The different variants (rotations and mirror-images) of the meander were hidden in a maze. Subjects were to trace patterns at their own pace and with fewest possible mistakes. Subjects were measured in three different ways. First, *acquisition phase* (how they learn, what their cognitive style is) and subjects were shown their results. Subjects in ordered sessions had to complete each rotation before the next would begin. Subjects in varied sessions were given trials in random order. Next they were measured with a *retention test*, and last a *transfer test*. The experiment was broken up into two sessions. The first session subjects were given the MFFT to identify cognitive process as either impulsive or reflective in their processing style. Then subjects were given a retention test and then the transfer test. The second session was given four weeks later, subjects were given the retention and transfer test again.

Even though reflectives made more mistakes at the beginning, in the end they made fewer mistakes than compared to impulsives. This difference suggests reflectives have a more efficient way to process new information/skills. As a result reflectives transferred information more effectively with less errors. Impulsives altered their cognitive process when the instructions emphasized making few mistakes. The result at first was that they took more time on tasks regardless of whether practice was random ordered, and were either equally or less likely to make less errors than reflectives. By the end impulsives made more mistakes overall when compared with reflectives. However, they were more accurate and worked slower in the random practice situation than in the ordered situation.

This study has some aspects of generalizability but overall it would not be possible to recreate this situation in my classroom. The authors provide sufficient description of experiments conducted and what was being measured; acquisition, retention, and transfer. The testing situation would not be able to be recreated now because of the computer system used at the time (1989). Jelsma and Pieters study was conducted in 1989, the time period is a significant factor to consider. The computer equipment used at the time is outdated for present day. In addition, the subjects used in this study were receiving class credit and this could have altered the subjects' authentic motivation and possibly affected testing results.

I could apply the findings to my question by considering conditions that are needed to foster transfer after a period of time. This study suggested that learners need time to explore in situations that are varied. Making more mistakes in new tasks and new learning can lead to deeper understanding in similar tasks later on. It seems that when impulsives are instructed to make few mistakes they will alter their processing speed and slow down. When impulsives slow down they may be paying more attention to differences in patterns when they are first learning. It is possible that impulsives and reflectives make more mistakes because it is not triggering them to look for nuances in varied situations. Impulsives altered their focus by being instructed to make the least amount of errors.

Overall, research showed “differential effects of contextual interference on performance on reflectives and impulsives” (Jelsma and Pieters, 1989, p. 80). The authors suggest that before you can apply contextual interference in an instructional setting effectively. The trainers/personnel should know if the cognitive style of the learner is impulsive or reflective. Therefore they suggest that the trainer should consider individual differences in the behaviors of reflectives and impulsives before designing an activities and practice schedules. This informs my personal practice and suggests that teachers should differentiate learning tasks for multiple learning styles so students have multiple entry points, and to retain information longer.

**The experience of learning for transfer.** Nemirovsky's (2011) goal in this phenomenological case study suggests that integrating the biological brain (mental constructs), with emotional, and physical experiences lead to an experience of transfer in learning. The study suggests that episodic feelings integrate new and old emotional and physical experiences at the same time that lead to sudden realizations or experience of transferring knowledge.

The researcher went through a series of interviews and selected the second interview with a 10 year old girl named Eleanor. Nemirovsky (2011) used a phenomenological research method to understand what Eleanor feels and how she responds to a new learning task. He suggests that *episodic feelings* are the root cause to memories in a specific time and place. Episodic feelings also have to do with the actual physical experience the body endures as well. This perspective of emotional and physical feelings combined, is what enables and produces the experience of memory or

the ability to recall past learning. In this study the researcher is taking detailed observation on Eleanor's body movements, gestures, verbal discussion and anything else that shows her awareness and realization of connecting old with new learning. The study is focused on a 3 min 20 sec interview with Eleanor. The study opens with discussion as Eleanor begins to use two buttons on the controller instead of one. Eleanor discovers the remote with buttons is a motion detector. She explores and plays with this for a while. She has a moment of remembrance and discovers the first button's functions. The author characterizes this moment as an experience of transfer.

Nemirovsky (2011) defines transfer as part of the study of how an experience becomes integrated and apart of another. The researcher proposes a new perspective that transferring learning experiences are a combination of cognitive, emotional, and the physical body. With this view in mind, he suggests that the moment where new and old memories come together is when transferring of new learning happens. Eleanor's experience of transfer can be observed throughout these findings. The researcher reports his observations with description of her actions and reactions to learning tasks. Eleanor felt: (a)that she remembered something; (b)the occurrence happened suddenly or in an abstract way; (c)this experience combine the idea and action together; (d)cannot force an occurrence of sudden memory or realization, it happens on its own to the learner and (e)the experience is rooted in physical activity.

Transferability cannot be directly applied to my students learning situations because of obvious differences in age, activity and tasks, and sample size. Although I cannot directly impose this study on my own students, I find Nemirovsky's (2011) proposal of transferring learning as a complete experience insightful. The experience of transferring learning does not only taking place in the mental pathways but there is also a strong connection with emotional and the physical body as well. The external validity is supported by the author's thick rich description of the setting, what was being observed, and how Nemirovsky documented Eleanor's experiences while learning. It is not known why this particular student's interview is chosen but he strongly supports his findings in the detailed description of her reactions to new feelings in learning. The findings are trustworthy because of the detailed description he gives of Eleanor's experiences of exploring, discovery, and the experience of transferring learning. Nemirovsky pays special attention to the subjects' gestures, emotions, and other details that help the reader to understand what she knows. The researcher lets the case study take him to new areas of investigating, uses mixed method approach, and provides rich detail and description of how methods were used.

This study makes me think about my own question in that I wonder if learning has to be purposeful and reflective, so learners can better recall past experiences; so that when new feelings emerge they can be connected with old ones. When connections happen in memory, physically, and emotionally, this may produce a long term effect of transferring. The study also suggests that educators can not force transfer experiences. It seems nearly impossible to script out the ability to transfer information to other areas. What educators can do is to create multiple learning contexts and opportunities for the experience of transfer to happen. The research suggest that teachers should increase the ways students make connections from past learning experiences to be combined with new learning tasks. This can happen in multiple ways; giving more time for tasks especially in new learning situations, using different tools or other gestures or symbols. Also, students working with peers in groups and having a more experienced peer can foster the possibility of having a transfer experience of learning.

After looking at this study I realize that transfer of learning is situational and a personal transformation process that combines old and new experiences. The transfer experience of learning is affected by memories in specific moments in time. The conclusion of the study shows that transfer of learning has to do with cognition, feelings or emotion, and physical bodily experiences. This now makes me wonder what kind of experiences should teachers induce, and in what way can we connect the physical and emotional aspects of memory to new learning situations. Is it necessary to combine a learner's mental, emotional, and physical being, to make lasting and transferable connections in new situations? I would like to further investigate what are the optimal conditions that support these episodic memories that lead to the transferring of knowledge experience. These are the memories that connect old learning with new learning experiences. I wonder what the best way to do this in the classroom.

**Increasing *relevant* information while learning new tasks.** The researchers van Merriënboer, Schuurman, de Crook, & Paas (2002) constructed a quantitative experimental study to show how *redirecting attention* from *extraneous cognitive process* (irrelevant information) to *germane cognitive process* (relevant information) will make training more efficient. Meaning there should be a balance in cognitive load during training and in the transfer tests after training. In this study they hypothesize that cognitive load is higher for the conventional group than the other two groups. Germane cognitive load refers to information that aids in building schema, it is directly related to learning. On the other hand, extraneous cognitive load is not relevant to learning, and this type of process should be reduced in learning. It was thought that the group with completion problems in *high contextual interference* (learning in varied settings to increase germane cognitive load), would have better training results compared to the group working with conventional problems in *low contextual interference* (ordered practice in one type of problem solving).

The researchers conducted three experiments and this analysis is of Experiment 1, the first of three. This experiment was conducted to minimize the extraneous cognitive load, which is the cognitive process that distracts from learning or building schema. This experiment used 87 first year Communication Science students between 18-23 years old. The subjects were randomly assigned to three separate groups. The groups consisted of *completion* group (COMP), *conventional* group (CONV), and *learner-controlled* group (LC). The groups received training on programming computers in coding and design of new programming according to three different types of problem solving activities. The first activity was conventional problems, subjects had to start from the beginning and solve in a specific way. In the next activity learners had to complete problems that had been started. They still had to solve in a particular way that was given, but they had some assistance until they became more competent in solving. Eventually the problems turned into the conventional style and gave no partial solutions. The last activity allowed the subjects to choose their own problems to solve, they could switch from conventional or to completion type. Subjects were rated on a nine point scale that measured mental effort while solving. They then tested for transfer by having subjects find errors in the computer program. It is suggested this was not an easy task. Subjects received information about the experiment, then were trained and given instructions on working with Completion, Assignment Constructor (CASCO). CASCO is a computer based system for learning. The subjects used CASCO for up to 180 min in each of their groups to solve the differentiated activities. While working with the program, their mental effort was measured every 20

minutes on the 9 point scale. After subjects are finished solving problems they received an hour break before they took the transfer test. The transfer test was said to take up to 30 minutes.

The findings showed a pattern in the learner-controlled group. Learner-controlled transfer tests results were significant ( $p < 0.05$ ) compared to the convention and completion group. This positive result in transfer results may be from allowing the subjects' to take control of what type of problem they solved, having been given a choice and control of their learning. It could be that the subjects were invested and their attention was activated while learning. These results suggest germane cognitive load (relevant information) was utilized in this case and extraneous cognitive load (irrelevant information) was decreased. With the learner's ability to keep interest, they can utilize their mental constructs by way of information that adds to schema construction, while not feeling overwhelmed in the learning tasks.

This study is not generalizable overall for my own classroom. The subjects used and the context of the testing conditions would not be able to be reproduced in a public school classroom. The subjects are in college, they have some college education with Science background, and the context is in a university setting, not public school. I can trust the observations and findings because the experimental treatment and testing instrumentation used was consistent. The findings are objective because CASCO the computer instrument was used to measure results. The researchers speculate that the learner-controlled group's results in being able to transfer may be from having control and choice in choosing which problems to solve. The researchers suggested that this is because the learners were involved and used more schema building information, they rated their mental effort lower than other groups tested.

I gleaned specific findings from Experiment 1 that will help to inform me on the conditions a learner needs to foster far transfer, being able to apply knowledge to other areas. The LC group showed significant performance on the transfer test. Suggesting that when we give students the opportunity to choose for themselves how they want to solve problems, then it is thought the learner will stay invested and show deeper interest; thus, supporting further transfer in the long run. I cannot generalize to my own students but I do see value in the findings. The subjects were randomly sorted into learning groups and sufficient description was provided in how the study was conducted. They study revealed how they measured transfer and the subjects' mental effort while doing tasks. I would also question if subjects preexisting knowledge added to their ability to be able to use CASCO. There was an assistant that was with subjects while they were being tested. There is no information given if the assistant was able to help, or assist, and to what extent did this person help or hinder testing results.

This study showed that when learners are given a choice in how to solve problems, they are more likely to be interested. The study suggests students are able to make stronger connections that add to schema because the subjects rated a lower mental effort being used while solving tasks. Another insight from this study is the transfer results of the LC group. This suggests to me that if students are able to choose how they solve situations, to hold interest and stay motivated, then they will most likely remember the knowledge and experience.

This suggests in my own investigation that I should increase opportunities for my students to have control over their learning and to explore possibilities in new tasks so that it will increase their ability to transfer that knowledge to other areas. I also wonder if the students rating their mental effort triggered more reflection during learning. That would suggest the more we have students

reflect on learning experiences and how they feel doing them, then they would be more likely to remember the experience.

**Redirecting learning to increase far transfer.** Experiment 3 is the last of the three experiments that (van Merriënboer, Schuurman, de Crook, & Paas 2002) conducted in the same case study as Experiment 1. This study is a continuation from Experiment 1 (as discussed in my last analysis), but the researchers are looked at transfer in Experiment 3. In this quantitative experiment researchers wanted to alter subjects focus by using completion problems combined with *high contextual interference* at the same time. This means subjects will have to complete problems in varied settings with redirecting to relevant information. *High contextual interference* (learning in varied settings to increase germane cognitive load) was thought to lead to increased retention and transfer of skills, as compared to *low contextual interference* (ordered practice in one type of problem solving). This experiment showed that high contextual interference was a method that will direct learners toward better retention and transfer of learned skills compared to being in a low contextual interference setting.

In this third experiment 87 first year Educational Science and Communication Science students were used. They ranged from 18-23 years old. The subjects were randomly assigned to one of four groups'. *Completion-low contextual interference* (COMP-LCI), *completion-high contextual interference* (COMP-HCI), *conventional-low contextual interference* (CONV-LCI), and *conventional-high contextual interference* (CONV-HCI). Some of the subjects had computer knowledge, but no one had programming experience. Much like Experiment 1, subjects received information about the experiment, and were given instructions and written material on using CASCO program (computer programming). Then participants worked with CASCO in one of their randomly assigned groups for 180 mins. After finishing each activity they rated how much effort they used on a scale from 1 (low) to 9 (high). The transfer tests consisted of three parts and were given 1 hour after training activities. Researchers tested for *near* transfer (apply to similar tasks), *intermediate* transfer (medial knowledge and ability to transfer skills), and *far* transfer (apply to different context or tasks, outside of learning situation) within an hour. Twenty minutes was given for each transfer test. Results for Experiment 3 compared the difference in completion and conventional problem solving. Far transfer showed significant results ( $p < 0.025$ ) for completion group compared to conventional group. These findings suggested that minimizing cognitive processes that do not add to brain construction will not distract from the necessary brain function. The researchers showed that redirecting learners in high contextual interference had a positive outcome for completion group but an opposite effect on the conventional group. Overall the completion group had significantly higher far transfer test results in high contextual interference. Researchers suggested emphasizing relevant schema in new learning and minimizing activities that distract. In combination with redirecting learners, this will provide better efficiency and transfer in learning.

Although the reliability of the testing conditions were the same in Experiments 1 and in Experiment 3, I cannot generalize this study to my own personal classroom, overall. This study used college age students with some computer knowledge, the treatment and context would not be duplicated with my students. In Experiment 1, the subjects had no previous computer programming experience, and the findings are objective in that they used sound tools to retrieve and record information. The study also showed strength in the reliability of how far transfer was reached by increasing relevant information in varied learning situations. There are some interesting and relevant findings for how to increase transfer by increasing germane cognitive load (relevant to

learning). Such as redirecting attention by balancing the amount of information that distracts from learning connections (extraneous cognitive load), and increasing chances for connections (germane cognitive load) in new learning tasks. The researchers suggested presenting learning in different ways, asking the learner questions about insights in the task, and having group discussions. This suggests that the more metacognitive we can get students to be in their learning, the better chance for a broader transfer of knowledge.

This study makes me think about the type of conditions that could be useful in transferring knowledge. Redirecting learners in new tasks had a positive effect when the learning conditions were organized and balanced between necessary and unnecessary information. This is thought to have more significance in long term transfer because distractions are minimized. Conditions that foster transfer for learners likely need to be redirected to decrease unnecessary information and increase relevant information to build understanding and thus transferring ability.

These findings suggest that learners need to have an organized setting that increases relevant connections in new learning. In addition to minimizing distracting information at the same time, these conditions could greatly improve transfer in the long term. Another suggestion the study recommends to increase accuracy is to reflect with the learner in new activities and present information in varied ways. For my practice this means that I need to engage my students in reflection and what types of learning worked for them. I also would want to make students aware of practices or habits that distract or take away from learning. This would reinforce that students have become aware of learning practices that assist their way of thinking, and they become aware of what hinders their thought process. I would add to the findings from Experiment 1, that giving the learner a choice in how to solve problems could increase their attention and motivation as well. Another finding that I am pondering is how teachers can optimize transfer by balancing necessary and unnecessary processes in mental construction.

**Summary and insights for conditions that foster transfer.** This investigation looked at the conditions that best support the transfer of new knowledge to other contexts. My goal is to find out what conditions support transfer at the cognitive level. I want to know how educators can best support students by creating the most sustainable learning atmosphere to maximize learning efficiency. My search led me to think about ways we can organize and structure presenting information to our students, while giving structured choice in activities.

Although in my literature review only one qualitative study was found, these methods suggested that the transfer of information is not only a cognitive experience but an emotional and physical experience as well (Nemirovsky, 2011; Zull, 2002). Students need time to explore and play with new tools to have valuable experiences. It is at a precise moment when new and old feelings intersect that triggers the experience of the transfer of learning (Nemirovsky, 2011). We cannot prescribe or induce when transfer will happen, but Nemirovsky (2011) suggests that because it's not strictly happening at the mental level that the physical and emotional experiences of old and new coming together solidifies transfer. This research provided the background to suggest that, giving time to explore a new task, using different tools, working with others, and working with experienced peers are the optimal conditions and tools to foster an experience of transfer.

Jelsma & Peters (1989) study suggests that learners need time to explore in new learning situations that are not ordered but situations that are varied. So that if students are to be reflective learners, they should make mistakes in new learning, so in the end they are able to have a deeper knowledge to support far transfer. When learners are instructed to make fewer mistakes, it is possible

that they will slow down their processing and pay more attention to differences and patterns when they are first learning. It is possible that their focus was altered because the emphasis was not on time, but on fewer errors suggesting that their cognitive process slowed down. This study indicates that when attempting to create ideal learning situations for transfer, we need to think and understand what type of learners we teach. In this study the way a reflective learner transfers knowledge is not the same as the impulsive learners in this case. This suggests to me that we cannot predict how learners will transfer knowledge, but that it happens on an individual basis. Another critical aspect in planning out how to implement transferring knowledge is that we must know what type of learners we teach.

The next study suggests to me that students are able to make stronger connections that build schema construction if they are able to choose and be in control of their learning. When learners are in control of their conditions, the study showed they retained information longer with the ability to transfer, compared to learners who did not get to choose. Learners who were able to control their problem solving methods reported that they used less mental effort (van Merriënboer et al., 2002). I wonder if rating their mental effort triggered some self-reflection and or awareness of what they were doing? Did this add to their learning, and or the ability to transfer? In another experiment, van Merriënboer et al., (2002) observed that redirection or interruption of learning was beneficial to long term transfer. Redirecting learning conditions that focus on making relevant connections and minimize distracting non relevant information is ideal for long term transfer. Transfer takes a balance of information that is decreasing irrelevant and increasing relevant information while providing structure in learning choices.

McIntosh, Rajah, & Lobaugh, (2003) also references *contextual interference* (see Jelsma and Pieters, 1989) in *functional connectivity*. There is an important brain system that underlies specific behaviors for learning. There is a pattern between the medial temporal lobe (MTL) and prefrontal cortex, that when information moves back and forth, this is thought to be where *awareness* in learning happens in the brain. Connected with Zull's (2002) learning cycle, this area of the brain that is being used to trigger awareness also correlates with *transformation line* Zull discusses. That is when learning crosses over from being input to being controlled by the learner, and it becomes their own. This is a biological and physical change in the mental constructs of the learner (Zull, 2002). This suggests that it is the process of reflection on observations, to the abstract hypothesis where a learner is taking ownership of the learning, that produces awareness of one's own understanding.

My investigation continues as I think about how to create various situations where transferring information can happen in learning and to other areas of life outside of the classroom. There is not one right way to transfer information and there is no prescribed formula that is known to make sure far transfer happens. In looking at my findings from my analysis there are some general ways teachers can maximize the possibility of transferring experience of learning. Learners need time to explore new learning situations and feel value in making mistakes. It is in reflecting in mistakes that make learners aware of their own mental processes. Students also need varied learning to be able to transfer a set of skills to another area of new knowledge. I am also interested in creating structured choice in my classroom. Meaning, I want to know how to create various learning situations where students feel they are getting choice, but I am able to control what they get to choose from. The last finding that has impacted my decisions as a teacher is that I need to think about how to combine cognitive tasks with the learners emotional and physical aspects. To

experience transfer of learning, this phenomenon just suddenly happens. I am now wondering the best practices to engage in for planning and instructing so my students will have many opportunities to apply their skills in other areas.

My investigation has lead me to ask more questions. What are the best conditions to foster redirection in learning? How do we identify the most effective combined methods to use to increase the possibility of transfer and far transfer (different contexts)? I plan to engage my students in more metacognitive tasks while they encounter new learning so they are aware of the positives and negatives in learning. In my future classroom I will be experimenting with different ways to engage my students and how to motivate them to make learning authentic and to make it their own. By creating a warm, safe and challenging environment in the classroom I can offer my students the safety and confidence they need to make huge leaps in their learning.

### **How Does Transfer Look for Spanish-Speaking English Language Learners in Terms of Academic Language Development?**

*by Claudia Marin*

After we decided as a group to focus on researching transfer as an over-arching concept, I thought it would be worthwhile to research how to support learning that promotes transfer in a Spanish-speaking English Language Learner (ELL) classroom. Being an ELL myself, and a native speaker of Spanish, I understand how arduous it is to acquire a second language; if we add trying to learn content in a language that you do not dominate, the task becomes even harder. This is why investigating the transfer of skills and knowledge between languages may help set up Spanish-speaking ELLs for success in our public schools. According to the National Center for Policy Analysis, “The high failure rate of Hispanic students in United States public schools has remained between 30 and 35 percent over the past 25 years...” (Duran, E., Shefelbine, J., Carnine, L., Maldonado-Colón, E., Gunn, B. & Carnine, D., 2003). This is one of the reasons why this research project is important to me. I want to explore ways to support the learning of Spanish-speaking ELLs to aid in the transfer of skills to other contexts, or in this case, subjects at school. My exploration is directed towards Spanish-speaking ELLs not only because I am a native speaker of Spanish, but also because Latino students comprise around 75 percent of the language minority population in the United States section of this minority population consists of ELLs; Spanish is the primary language spoken by 67 percent of all ELLs in the State of Washington (Malagon, H., Mc Cold, P. and Hernandez, J. 2011). It is true that some of the features of Spanish resemble some of English, like the alphabet, some cognates with Latin roots, and some sentence structures. Professional literature suggested that Spanish speakers could transfer what they already know in terms of vocabulary and literacy skills, among other features, into the acquisition of a second language (Hudson, R. F. and Smith, S. W. 2001; Duran et. al, 2003). This is a point of wonder for my research because several studies on transfer mentioned that transfer does not happen automatically (Bransford, J., Brown, A. L. and Cocking, R. R. 2000; Perkins, D. N. and Salomon, G. 1988). In fact, professional literature dedicated to teaching reading to Spanish-speakers pointed out that transfer needs to be taught explicitly, “...transfer of learning in concepts of print from one language to another is facilitated when students are directly told and shown that a previously learned concept is also found in the new reading material” (Duran et al., 2003). Literature for second language transfer also pointed out that it cannot be assumed that learners will transfer what they learn

outside of the classroom (James, 2012; Jiang, 2004). If the transfer of language knowledge and skills do not happen spontaneously, then this research could help inform and refine my teaching practice while working with this particular English learners' population.

One of my endorsements is ELL because I believe I can help these learners from the unique perspective of a person who, despite being an advanced speaker of English, still faces the challenges they face on a daily basis; making sense of what they are learning while developing proficiency in English. It does not matter how proficient you become in a second language, it is a lifelong learning process. At the same time, being bilingual provides me with an exceptional opportunity to help these students navigate contrastive grammar for instance, or developing highly abstract concepts in a language they already have a semantic network in place. The literature revealed how important it might be for students who are on the road to becoming bilingual, receiving support in their native language development; the support might determine how successful they become at school (Perkins, D. N. & Salomon, G. 1988; Jiang, N. 2004). Cummins, proposed in 1991 two types of language that will transfer to the second language and improve its acquisition:

The first is everyday basic interpersonal communication skills (BICs), which rely heavily on the context of the conversation...The second type is cognitive/academic language proficiency (CALP) which is needed to understand communication without contextual support...Cummins theorized that CALP developed in the first language transfers to the second and helps support second-language acquisition...if children do not develop certain level of CALP in their first language, the benefits will not transfer to the second language, possibly leading to problems in reasoning and literacy". (Hudson and Smith, 2001, p. 37)

Most of the professional literature I reviewed has reinforced what Cummins theorized about academic skills transferring among languages (Irujo, S. 1986; Carlo, M and Royer, J. M. 1991). However, the studies I reviewed all focus around students who have CALP in their home language (Carlo, M and Royer, J. M. 1991; James, M. A. 2012). This draws attention to limitations in my research since not all Spanish speaking ELLs in our public schools have received formal schooling in their first language. Moreover, not all Spanish speaking ELLs consider Spanish their dominant language, and so their proficiency has evolved from Spanish being the dominant language, to English. These students may have never received literacy skills in their first language, when this was the dominant language. Spanish-speaking ELLs are not receiving literacy instruction in their native language According to Hudson and Smith (2001):

There are many questions about why such a large number of Hispanic students demonstrate a high rate of reading failure...We propose that... Young children whose first language is not English and who are not proficient readers are not getting the type and quality of reading instruction they need in the language in which they need it. (p. 37)

Even though the authors refer to elementary students, this situation can be applied to older students who have gaps in their native language education, or those whose literacy skills are not strong enough to be transferred to English. This is another one of the reasons why this research is

important to me. Reading is just one of the literacy skills needed to succeed in school; however, it is related to listening and influences writing and speaking. All these forms of literacy are related to thinking as well. Ritchhart, Church and Morrison (2011) proposed eight thinking moves that relate to different contexts, but that are essential to be academically prepared to face school demands. Learning how to think about complex problems or learning how to apply previous knowledge to current content, and future learning is directly connected to how students perform at school. I ponder if it is possible that one could build academic language using the basic interpersonal language skills of the first language as a foundation. At the same time, I wonder how my instruction needs to be shaped to support the transfer of knowledge these ELLs may already have in their first language. According to several language acquisition theories, most of the knowledge and skills you possess are indeed embedded in your first language (Cummins, 1991; Duran et al. 2003). In order to support transfer of learning in ELLs whose first language is Spanish, I need to research which skills and knowledge have the potential to be transferred while learning a second language. Even if these students have not received any type of formal schooling, and have big gaps in their education. These students may not be receiving any explicit instruction that helps them connect their two languages to support their literacy growth, thus my research question could help me to bridge the potential literacy gaps that Spanish speaking ELLs have in our public school classrooms in order to support better the transferring of what they learn to different contexts. This may enhance second language acquisition as well. I have reviewed the following studies that deal with second language learning and transfer; the focus evolves from how *part/whole transfer* work with bilinguals to *semantic transfer* and its implication for second language vocabulary teaching. Then the emphasis moves to the degrees of similarities between idioms determining *positive* or *negative transfer*, and following this the focus shifts towards the quest for real motivation to transfer second language learning between school subjects. This research ends with figuring out whether the transferring of skills between languages happens or not and what this implies for my classroom scenario.

**About bilingual inter-language interdependence or independence.** Saegert, Kazarian & Young (1973) wanted to test the hypotheses of whether the two languages a bilingual person deals with, exists independently or interdependently. They decided to extend the free-recall paradigm used in the study of subjective grouping, which is called *part/whole transfer*, to the bilingual learning situation. They implemented two quasi-experiments, using free-recall lists, on two different bilingual populations, English-Spanish and Arabic-English. The researchers tackled this study using the correlational study approach in both quasi-experiments, using the Constructivist paradigm. They collected the data of each experiment and analyzed quantitatively the results of each experiment first according to the trials, conditions and language used. Later the results of both experiments were analyzed together, and the correlation results interpreted in terms of the interlingual interdependence and interlingual independence hypotheses. The subjects were not chosen randomly; the researchers used fixed groups in both of the quasi-experiments.

The researchers discovered that when both the lists, part and whole, were presented in one language, it was usual to find negative transfer effects; which the typical result was found on the free-recall paradigm used to test *part/whole transfer*. However, when they used a bilingual version of the experiment, the researchers discovered that negative transfer appeared only when the list was switched from the subjects' dominant language to their non-dominant language. They analyzed the results of their experiments in relation to the hypotheses of interlingual interdependence and interlingual independence.

Saegert, Kazarian & Young started with two pre-existing hypotheses. The interlingual interdependence hypothesis stated that the two languages of a bilingual have an interdependent storage system, with two methods of access to that storage. While the interlingual independence hypothesis proposed that the two languages have two storage systems independent from each other to access information. The authors used two free-recall lists for both bilingual quasi-experiments. The second one had items in a language different from those in the first list -half of them were translations of the items in the first list. In each experiment there were two additional variables; the first one was the language of the first list (Spanish, S, or English, E for the first experiment and Arabic, A, or English, E for the second experiment); the second variable was the language of the second list (E or S, and E or A). The researchers combined these variables in a 2x2x2 factorial creating two unilingual lists (S/S, E/E; A/A, E/E), and two bilingual transfer groups (E/S, S/E; A/E, E/A). Each of these groups had an experimental and a control group.

For the first quasi-experiment, the researchers used 64 English-Spanish bilinguals who were juniors or seniors in high schools in Austin, Texas. The main characteristics these subjects shared were that their dominant language was English, and their first language was Spanish; these were the only criteria explained about the sampling selection. The selection was not random. The participants of the first quasi-experiment were divided into a control group and an experimental group. There were two free-recall lists. In the first one the participants learned a part list of 10 nouns, both the control and the experimental group. Then they learned a second list, the whole list, of 20 nouns; the difference was that this second list was in a language different from the first list. The second list (whole list) was composed of 10 items from the first part and 10 new items, for the experimental group; this list was in a different language than that of the first list. The control group learned a second list of 20 items that were not related to the first list. The subjects were tested individually in a small room. The lists were presented through a tape recorder. Subjects recalled the lists verbally and the researcher recorded them. The language used to provide instructions was English. The researchers used four orders of presentations for the lists to avoid serial learning. The language of the lists was indicated before learning. There was no mention of any relationship between the lists.

The subjects used in the second quasi-experiment were 64 Arabic-English bilingual college students whose dominant language was Arabic. They all seemingly possessed sufficient knowledge of English to attend English- language Universities in Beirut. The design of the quasi experiment was like the first one, except that the participant in this case had to learn 16 and 32 item lists for the part and whole list correspondingly. Also this experiment differs from the first in that the lists for the four experimental groups and their controls were either in Arabic or English. Only the experimental group had to recall the second list that contains the 16 items of the first list. The control group had to recall the second list composed of 32 completely new items. The participants were tested in small groups and they were supervised to ensure they worked individually. The lists were presented through a slide projector. Each subject was given six trials on the 16 items list, and eight trials for the 32 items list. Each trial used a different presentation order. The participants were told in advance whether the list was going to be in English or Arabic. The instructions were provided in English. The participants wrote their responses on sheets of paper.

In both experiments, the researchers discovered that when both lists, part and whole, were presented in one language, it was usual to find *negative transfer* effects, preceded by *positive transfer*; which was the result expected by using the free-recall paradigm that studied part/whole transfer. However, when they used a bilingual version of the experiment, the researchers discovered that

negative transfer appeared only when the list was switched from the subjects' dominant language to their non-dominant language. Positive transfer happened when the subjects learned the whole list in their dominant language. This supported the interdependent hypothesis as well because when a subject learned a part list in his dominant language, the way he stored these items was hard to modify when learning the whole list, which includes translating. This caused interference and produced negative transfer-less correct recall answers. When the opposite happened, the subject learned the part list in his non-dominant language, he made the translated items quickly available and easily stored the items in a grouping with no interference from the prior part-list learning, thus producing positive transfer-more correct recall answers. They found there were more arguments to support the interdependence hypotheses meaning that both languages shared a common storage system for both languages. Recalling items in the dominant language is easier than recalling lists in the non-dominant language. When a subject goes from a list in his dominant language to a list in his non-dominant language, then negative transfer will occur. If the languages were independent from each other there should be no negative transfer at all.

In this study the researchers did not go into details pertaining the way they selected the participants for both experiments; all that can be said is that it was not done randomly. However, they provided an adequate sample size for both experiments. At the same time, the authors provided sufficient description of the methods and procedures used in both quasi-experiments. They described in depth the way the words for the lists were selected in both experiments. They provide sufficient details so as to speak about the generalizability of this study and its results. The researchers provided more background information about the students' dominant language in the second experiment, and how this was measured at the end of the experiment. It is worth mentioning that Saegert, Kazarian & Young used the population of the first experiment in a study done in 1966. This suggests that both experiments were done with years of difference. Since both experiments produce independent results, it is possible to support even more the idea of generalizability for this study, and speak of its internal validity. The researchers used two different bilingual populations, with years of difference and still produced similar results, which were combined to present the validity of each interlingual hypothesis. The fact that the dominant language was different for both experiments adds reliability to the results obtained. Also by using different languages as different as Spanish and Arabic as the first language (dominant language) imprints reliability to these experiments' results, as well as identifying two different languages, English and Arabic, as the dominant in each experiment. The results then are not the product of the characteristics of a given language, but the dominance effect on transfer.

The study borrowed the part/whole transfer procedures used in free recall learning and applied it to bilingual learning. This research did not stem its wondering from second language learning. It does not go in extensive detail about the part/whole transfer idea either. However, looking at the references, the part/whole transfer concept appeared in a study in 1966 about subjective organization and the effects of repetition in multi-trial free recall learning. It seems that transfer here is treated as part of memorization, so I do not think that it informs the quest for optimal conditions for the transfer that our group larger question seeks to address, which is more oriented to transfer thinking skills. I can say that this research speaks more to my individual quest because I can certainly see the benefits of using students' dominant language to support transfer of bilingual learning. It is not the fact that one of the experiments deals with Spanish-speaking bilinguals that makes me see information I can use to advise my teaching practice, but the fact that the results point towards the use of dominant language resulting in positive transfer.

This study deals with a type of transfer that resembles memorization, which is not considered as an optimal condition for transfer of learning; nevertheless, if we use the term easy recall instead of memorization, we can see how it can aid students when dealing with hard to remember concepts or words. For instance, science vocabulary is needed to understand concepts related to ecosystems. In second language acquisition memorization plays an important role, it is not the most important, but it is part of learning a second language. Memorization is important not in the sense of rote learning, but in the capacity to store comprehensible input to benefit the acquisition of a second language. By using your dominant language the capacity to recall items easily increase; easy recall seen as positive transfer. Your dominant language is the one that you will use to store information and make recalling items faster. If instead of using dominant we replace this word for the language that helps you understand better, we see the dominant language as that language we use in the classroom that creates access points to all students. For this group, the idea of optimizing transfer refers to optimizing understanding because students will apply what they understand to new contexts; students seemingly do not transfer what they memorize.

**Semantic transfer between languages.** Jiang (2004) wanted to find out how *semantic transfer* happens in a second language. The initial understanding he used was, "... the semantic content residing in a L2 (second language) word is transferred from the L1 (first language), or that the concept onto which a L2 word is mapped is a L1 concept" (p.417). He explained he did not make any distinction between semantic and conceptual representation in this study. He wanted to know whether transfer happens, or not, when the meaning of a given word in the first language (L1) is related to, or is similar to the meaning in the L2. Jiang uttered that the semantic transfer hypothesis is worthwhile to explore empirically for two reasons. First, because form-meaning mapping is one of the basic processes involved in vocabulary acquisition; however, in second language acquisition research there is only limited discussion of form-meaning mapping. Second because, the semantic transfer hypothesis contradicts what many L2 researchers assume. It is believed that L2 learners acquire new meanings while learning new words.

The researcher approached this study using the Post-positivist paradigm to observe how semantic transfer happens and how to use these observations in second language teaching. The author used correlational study to handle his enquiry. The test results were analyzed quantitatively by recording the reaction times of the subjects on items with similar and different translations. The findings were shown in graphs that portrayed native and non-native reaction times.

The author declared three purposes for this study. First, to extend his findings from the 2002 study, what he called the same translation effect; moreover, to replicate the study in order to verify that the same translation effect was not the result of the materials he used back then. Thus, he intended to test the effect on different English as Second Language (ESL) speaker population. His Second purpose was to provide confirmation for the same-translation effect by using a design that he called cleaner than his previous study. Lastly, if he could duplicate the findings of this previous study then the third purpose was to explore pedagogical implications for teaching vocabulary in a L2. Jiang used a correlational method to test a potential relationship between same semantic content and time response.

The analysis of the data focused on the relationship between the semantics of the word in the L1 in relation to the semantics of the L2 and its effect in transfer. The second part of the study analyses the implication of the data on second language vocabulary teaching. Jiang stated that this study is a duplication of a previous one done by him in 2002; he used Chinese ESL speakers then.

The findings showed that there was a relationship between the similarity between words in Korean and English and the time response the subjects exhibited when confronted with pairs of words. The subjects reacted faster to same translation word pairs than to different translation word pairs; Jiang called this phenomenon the same-translation effect.

Jiang used 15 Korean ESL speakers for this study as well as 15 native English speakers. The selection of the sampling was not done randomly. The Korean speakers were students from an American University, and the native English speakers were students and staff members at the same university. None of the native English speakers knew Korean at all. This research is a quasi-experiment where subjects were exposed to a set of two words in English that could be related or unrelated in meaning; they have to decide just by looking at them whether they are related semantically or not as quickly and accurately as possible. Jiang measured how fast the subjects responded to the words they saw. There were two set of related English words, the same -translation set and the different-translation set. The same-translation set was composed by pairs of English words that shared the same translation in Korean. The different-translation set included English words pairs that were related in meaning, but had two different translations in Korean. Jiang predicted that the Korean ESL speakers should respond to the same-translation pairs faster than to the different-translation pair because the same-translation pairs had the same semantic content transferred from the same Korean translation. This hypothesis also predicted that no same-translation effect should be found among native English speakers. The participants were tested individually. The test began with instructions, followed by practice and then by testing. The test was done through a computer program that flashed pairs of words in English at the center of the screen. The words remained there until the participant answered whether the two words were related in meaning; they pressed previously assigned keys on the keyboard for yes or no. The ESL students were given a questionnaire at the beginning or the end of the test to figure out their English learning background.

Jiang included only correct answers in the analysis of the results. He performed two analysis of variance on related items only, one treating participants as a random effect and the other treating items as a random effect. He discovered that the Korean ESL participants were 540 ms (milliseconds) slower than native English speakers in responding to the related words. Also he found that there the participants responded to the same-translation pairs 64 ms faster than to the different-translation pairs. The native English speakers responded to the same-translation 16 ms faster than to the different-translation but the difference was not significant. The results confirmed the semantic transfer hypothesis predictions. If two English words share the same Korean translation, this would affect the response time and accuracy of Korean ESL speakers when judging semantic relatedness of English words. Korean ESL speakers responded faster and more accurate when the words in English shared the same translation in Korean.

Jiang divided the implications he concluded for second language vocabulary teaching and research in three issues: The first is lexical competence and semantic autonomy that he explained as developing an autonomous semantic system is the goal for L2 learning, meaning that with practice and time the L2 learner will develop a system that is shared by native speakers and it will not depend on the L1. The second issue Jiang discussed was L1 as a means for semantization, meaning that L1 needs to be included in teaching a second language to help learners understand the meaning of new words in the L2. Finally the author referred to overcoming semantic fossilization, which raised the issue of helping L2 learners transition from still depending on the L1 to compose meaning to the third stage of vocabulary acquisition. This stage means to learn new vocabulary in the L2 without aid from

the L1; the L2 word is integrated better and can be reproduced with little influence from its L1 translation.

In terms of generalizability, Jiang pointed out at first that the results of his study confirmed the results of his previous research. To him this meant that the results were applicable to all L2 learners no matter what was their L1, since he used two different ESL populations. In his final conclusions he admitted that the extent of generalizability of the findings to other L2 populations had to be yet determined, factors like vocabulary learning strategies had to be considered, as well as full immersion programs where the use of L1 was limited. The last factor he described was the typological relationship between L1 and L2. Spanish and English share some typological characteristics like alphabet and sentence structure, so this may produce a different result than the one Jiang found between Chinese and English, and Korean and English in terms of the same-translation effect on semantic transfer. The population used does not really reflect the population I use for my enquiry. The students used are college level; they were international students with advanced bilingual skills who possessed academic language development in their native language. I cannot certainly apply the findings to my target population who may only have basic interpersonal skills in English. I am not sure if my students would benefit from a test like the one described by Jiang, or if I would be able to find similar findings. I believe that the bilingual described in this author's study needs to possess a wide and varied vocabulary to make sense of the pairs of words described here. I am not sure if the test would work using simpler high frequency words. At the same time my target students may not possess an extensive vocabulary in their native language either. Jiang provided an easy to follow and detailed explanation of the procedures he followed when testing the participants which can be accounted to this study's reliability. Additionally the results suggest that the study measured what it was proposed in the beginning with the semantic hypothesis in place.

This study used adults who possess academic language in their L1. One of my points of wonder is how to facilitate the development of academic language using their basic interpersonal language skills as a foundation. This study did not provide answers as to how to do that. I have to say though that I could use some of the study's ideas for vocabulary teaching that where Jiang suggested the use of L1 to make sense of new words in L2. This is similar to the findings that could inform my question in terms of vocabulary teaching from the Saegert, Kazarian & Young (1973) study on using dominant language to facilitate word recall. In short, I can use my knowledge of academic Spanish to start building up academic vocabulary into my students' language repertoire, and at the same time help them to build up their concepts' knowledge that they could use as a foundation to transfer semantically into English as they are learning it. In terms of my group's question this study relates by pointing out that in order to make sense of a new word, students must have a semantic idea or a connection in their prior knowledge and vocabulary in order to understand what they are learning. The idea is that a way to promote transfer in the classroom is to use students' prior knowledge as a foundation. In the case of ELLs promoting language transfer looks like using the language that carries their prior knowledge so they can have an equal access to learning.

**Similarity of idioms related to comprehension and production.** Irujo (1986) realized that much of the literature about the transfer in the acquisition of idioms, from first to second language, referred to grammar. There were no studies that dealt with the actual comprehension and production of idioms. At the same time in the previous studies, idioms were not being separated in categories according to their degree of similarity to their first language equivalents. The author decided to investigate whether the first language (Spanish) would influence the comprehension and production

of idioms while acquiring a second language (English). She used a quantitative approach to conduct her research applying the Constructivist paradigm to it. The study design is correlational study intended to show the correlation between independent and dependent variables. Irujo wanted to test whether there was a relationship between the degree of similarity in idioms (between Spanish and English) to the levels of comprehension and production.

Irujo started her inquiry working with three hypotheses:

1. Identical idioms will show evidence of positive transfer; they would be easiest to comprehend and to produce correctly.
2. Similar idioms would show evidence of negative transfer; while comprehension might be almost as high as for identical idioms, production of these idioms would reflect interference from the first language.
3. For different idioms, ...no evidence of either positive or negative transfer; subjects ... comprehend and produce fewer different idioms.... (p. 290)

She worked with two variables. The dependent variables are comprehension and production. The independent variables are idioms with identical structure and meaning, idioms with similar structure and meaning, and idioms with different structure and meaning. The predictions were saying that the study would find evidence of *negative transfer*, evidence of *positive transfer*, or neither. The author used a correlational model to test the relationship between idioms. The researcher recruited a total of 12 undergraduate advanced learners of English from Venezuela enrolled in an American University. The students were not randomly selected; only those who were interested enough in the study to give two hours of their time in exchange of a small reimbursement were chosen. Irujo used tests with different idioms in English and Spanish to measure comprehension and production. The idioms chosen in advance for the test were selected using a questionnaire on different subjects. She used 23 Spanish speakers and 30 English speakers. They were asked to define the idioms and rate, on a scale of 1 to 5, frequency of use for each idiom. Based on the questionnaire results, 15 idioms of each type-identical, similar and different-were chosen; a total of 45 idioms were used. Comprehension was tested using a multiple choice test and a definition test. Production was tested using a discourse-completion test and a translation test. Tests were created to assess recognition, comprehension, recall, and production of these idioms.

In terms of considering this study generalizable, I can say that the sample size seemed appropriate. The students were not chosen randomly, and they received a monetary compensation for their participation in the study. This variable could mean that the participants put extra effort in the tests due to the extrinsic motivation, so the results may not be completely realistic; the integrity of the sampling seems compromised because of this. On the other hand, the test were designed to measure what they say they measure, the correlation between degrees of similarity in idioms from two different languages, and the characteristic of the idiomatic transfer, positive or negative. However, not all the conditions of the study tests can be reproduced; the population sampling was too specific. In conclusion this study cannot be generalized to the population segment my inquiry is about. The author worked mainly with advanced learners of English who had passed the Test of English as a Foreign Language (TOEFL), which is a proficiency test. My focus is ELL students who are challenged by the acquisition of academic language, and possibly everyday language as well. I need to consider this when deciding the implications for my classroom, and which idioms would be

beneficial for my Spanish speakers, and which ones to avoid. Irujo worked with undergraduate students at an American University. I will be working either with middle or high school students. This is another issue I need to consider to decide which parts are valuable and applicable to all grade levels. There were some lurking variables in this study that were not taken into account and make me doubt its internal validity. The students selected have different levels of proficiency. This alone could have caused differences in the scores for comprehension and production. The researchers claimed that the hypotheses were confirmed; however, the different levels of proficiency could have had an effect on the dependable variable, the tests scores for comprehension and production. It is not mentioned who created the tests, whether it was a Spanish speaker from Venezuela or a Spanish speaker at all. This could also have had an effect in the correlational relationship between the tests and the scores. If the person who created the test was not a native speaker or familiar with the strand of Spanish these students spoke, this variable could have also influenced the test scores.

I believe the study and its results are not a fluke. The author was very watchful while designing the tests. She provided a detailed account of how the idioms used in the test were selected. Irujo used four graduate students as independent raters to check the reliability of the scoring of the tests; the inter-rater reliability was .87. The hypotheses of the study were corroborated, and so the correlation between degrees of similarity between idioms in Spanish and English, and comprehension and production proficiency was asserted.

The author explored the transfer of idioms between first and second languages, taking into account more than just grammar. Irujo introduced categorization of idioms according to similarity between two languages to determine how transferable they are in terms of comprehension and production. The results informed and confirmed once again how evident the influence of the first language in transfer is. The forms and patterns of Spanish influence the second language learning. I need to be careful with those patterns that and forms that are similar since according to Irujo provoke more interference than positive transfer. I can inform my question by identifying patterns and forms that need to be taught using a contrastive approach to reveal those similarities that could produce negative transfer.

**Real motivation to transfer.** James (2012) wondered if all the extensive research on *motivation to transfer* could be applied to L2 education. He stated that most of the literature on L2 transfer focused on learning; he wanted to address motivation for transferring as well. He pondered about the influence of motivation to transfer L2 learning into other contexts. Moreover, he wanted to elucidate whether motivation was part of L2 learning transfer at all, and if it was part of it, what were the elements that made it happen; he called it L2 transfer motivation.

In the first part of the study James established a theoretical framework to create a definition for L2 transfer motivation using mainly second language acquisition research to inform his definition. He used this study to answer two empirical questions he had about L2 transfer motivation and if it happened what were the reasons why this phenomenon happened. He used a sheltered college level ESL composition class constituted by 40 international students. He identified a college course of sheltered ESL English for Academic Purposes writing class (EAP), equivalent to a composition II class college level. This course was the last requisite in terms of writing these students had to fulfill in order to graduate. These students were all undergraduate level. The class was ideal for James' research since students were taking other courses that required academic writing, so students had immediate opportunities to transfer learning. The course was divided in 4 sections taught by three different instructors who did not collaborate in planning for the class or teaching the class as a team.

James pointed that all sections used different text books, but they were the typical text books for a composition class of this level. James offered extra credit to those students who would volunteer to participate in the study. He used a phenomenological paradigm to conduct the study. He handled the study qualitatively using a series of individual semi structured interviews to research his questions; he did so to get to the reasons why, or why not, students may be motivated to transfer L2 learning to other contexts. The 40 students he used were from different parts of the world, mainly Saudi Arabia, Korea, China and Taiwan; there were not L1 Spanish speakers taking this course. He ran the interviews over three weeks close to the end of the semester; mainly to ensure the students were familiar with the content of the class, and that they were focused on the interviews and not in their finals. He had tested the set of interview questions before with freshman students from another EAP class to make certain the questions were understandable and they would not take too long to answer. He analyzed the results using a process that used ideas created for rational analysis of qualitative data. He transcribed the interviews and divided the transcripts into units of analysis according to three main questions he had selected in advance. He then coded the units into yes, no or mixed answer to his questions in terms of desire, attitude and effort. After this he analyzed the interviews for patterns related to his 2<sup>nd</sup> research question-what factors influenced these students' motivation to transfer learning? He identified and categorized the reasons the students gave for transferring or not. He found 8 categories. He used an inductive approach to create the 8 categories that he believed encompassed all the reasons the participants provided. The categories were: (a) *perceptions of opportunity for transfer*; (b) *personal beliefs about transfer*; (c) *perceptions of resource availability*; (d) *perceptions of requirement for transfer*; (e) *expected impact of transfer*; (f) *perceptions of competence* (g) *attitudes toward learning outcomes*; (h) *attitudes toward learning and transfer context/tasks*. James found that motivation to transfer, that included a combination of desire, favorable attitudes, and effort, was rare.

I don't think this study has transferability because the sampling was too specific, so the results could be applied only to that particular segment. My study is directed toward a very particular segment of the ELL population, Spanish speakers, who are high school level and live in this country. They do not possess academic language in their L1 like the population James addressed. He advised that he did not believe his findings could be transferred, "This study was conducted in only one L2 [second language] education context-EAP writing education-so it is uncertain how broadly these findings would apply" (p.64). I believe I can trust this study though. James first checked extensively the literature on L2 motivation and transfer before coming up with his own definition on L2 transfer motivation. In his data collection segment, he attended to reliability on the way he coded the data. He asked another individual with experience in qualitative research and teaching EAP writing courses, to re-code some of the data randomly. He then compared the coding decisions and the result was an inter-coder reliability of 92.7%. I can trust this study because the author takes time to check his procedures for reliability before even coming to conclusions. Also he extensively pointed at the possible constraints and flaws in his study on the conclusion; besides he advises for future research and points at that his study is only the beginning in terms of answering his research questions.

Despite the fact that I cannot transfer this study results to my scenario, I found very interesting the implications for my classroom learning environment that the 8 categories may inform. James analyzed the answers to his interviews in terms of desire, attitude and effort as the true reasons for transferring, and came up with 8 categories that speak to mindset, confidence, self-image, self-competence perceptions, and expectations among others. Motivation for transfer is a very complex

issue that has several allusions to aspects related to creating a safe and welcoming environment where mistakes are welcomed, and risk-taking is a plus. At the same time the results, even though applied to a very specific population segment, spoke to attending to students' schema in terms of what transfer is, what it meant to them, if it meant anything at all. Transfer is an elusive concept, even for college level students; this makes me think deeply on preliminary steps I need to take to maybe fill possible gaps that my students may have in terms of their understanding of transfer, before even planning procedures to support transfer. Additionally, James presented the value of metacognition to support transfer for L2 students. Metacognition is an area that somebody in this group is attending to more explicitly in her individual inquiry. I read the value of metacognition repeatedly as a key ingredient to optimize transfer in several studies (Bransford, J., Brown, A. L. & Cocking, R. R. 2000; Engle 2006). Metacognition linked to motivation informs not only my classroom learning environment, but also thinking routines I need to get in place in my teaching practice.

**Correlation between literacy skills in English and Spanish.** Carlo & Roger (1991) were looking to test a hypothesis on the correlation between Spanish reading skills and English listening and reading skills. This to support bilingual education and the development of cognitive skills in the L1 benefiting those skills in the L2. Transfer from one language to another occurred when individuals who are very competent in some educationally relevant aspect of L1 become competent in the same aspect of L2 when L2 is acquired.

Carlo & Roger studied a group of 49 sixth graders enrolled in a transitional bilingual program from a public school. They all were native speakers of Spanish. The majority was originally from Puerto Rico or from Puerto Rican descent. They used Sentence Verification Technique (SVT) tests for their inquiry. The tests in Spanish were prepared by a graduate Puerto Rican student. The tests in English were constructed by a native English-speaking post-doctoral student. They used listening and reading tests in both languages. Each test was based on three passages at each grade level. They tested these students twice while they were fifth graders, and one at the end of sixth grade. The tests were done on two consecutive days and they lasted for an hour and a half. They appear to approach this study using the Transformational Paradigm to advocate for bilingual instruction of ELLs. Correlational study is the design used by the researchers to examine the nature of the relationship between indices of competence in both languages; they used correlation and regression analyses, and gathered the data for analysis quantitatively. They found that transfer of cognitive skills happen between languages, and they take time to appear on the second language; different skills will appear at different times, but the instruction has to be done first on the native language of the learner in order to develop cognitive skills properly and ensure a smooth transfer to the second language.

There are other studies that back the correlation found in this study between the literacy levels in Spanish and English. (Duran, E., Shefelbine, J., Carnine, L., Maldonado-Colón, E., Gunn, B. & Carnine, D., 2003). I can use this study as a reference since it does study Spanish speakers who are learning English. However, I cannot generalize its findings because the sampling was too specific and it did not parallel the grade level of my population. Besides, the population addressed here belongs to a specific segment of Spanish that may constitute a lurking variable working against generalizing the results of this study. The authors performed correlation analyses between reading skills between the two languages, plus regression analyses between listening skills in different tests in Spanish to predict reading proficiency in English. They made sure that it was not only reading skills they were addressing but also listening skills benefiting the development of reading skills in English. I cannot trust the study completely because the researchers did not bring an outsider to analyze their

data. They did though bring a native speaker of Spanish to create the Spanish test, and an independent student to create the English tests, so the materials were designed by native speakers which makes me trust at least that the tests hold reliability. The findings were not a fluke because the researchers were very rigorous when analyzing the data, they used two methods to test the relationship between the two languages and the skills level. Besides they tested the subjects several times during fifth grade and when some students were on sixth grade.

I can use this study to inform my research considering using the first language to teach skills which students can transfer into their second language. Specifically, this study analyzed Spanish speakers who are the population I am addressing in my research. Even though the study is not generalizable to my inquiry, I can still get ideas in favor of bilingual education resulting in more benefits than harm to support transfer. The study was really brief, but it reinforced the ideas taken from other readings about how literacy skills transfer among languages (Duran et al. 2003; Perkins, D. N. & Salomon, G. 1988). I still need to look for more research that refers to building literacy skills in older ELL students who have gaps in their education, and those who have never received formal literacy instruction in their native language.

**Summary and insights.** In a bilingual free-recall task “When transfer (meaning forced translation in this sentence ) was done from the dominant to the nondominant language, consistent *negative transfer* was obtained, but when language order was reversed, so that transfer was from the nondominant to the dominant language, consistent positive transfer was obtained” (Saegert, Kazarian & Young, 1973 p. 543). These findings could be easily explained assuming the interdependence of the two languages operating in a bilingual. “...subjective groupings in the dominant language are relatively easy to form and relatively difficult to modify whereas subjective groupings in the nondominant language are relatively difficult to form and relatively easy to modify” (p.544). Easy recall was treated here as *positive transfer* and *negative transfer* is treated as poor results when given a bilingual free-recall task. This spoke to my rationale in terms of supporting verbal learning when using the dominant language of a bilingual student. Verbal learning in terms of free-recalling words is related to the development of CALP because academic language is characterized by the lack of context to compose meaning from it. My question was informed in terms of becoming aware of how to use my students’ dominant language in order to support positive transfer when translating words or when transferring highly abstract concepts from Spanish to English. This could be done while students acquire academic language in their dominant language to be transferred later positively to their second language.

Jiang’s findings (2004) did not really answer my quest for developing academic language. However, his thinking about the implications of his findings for second language vocabulary teaching provided food for thought in terms of advocating the use of the dominant language to support meaning development and understanding that could potentially favor semantic transfer, “There is already considerable evidence indicating that semantic development can be very slow and often unsuccessful in L2 acquisition...” (p. 425). This author suggested that the use of L1 cannot be avoided if the idea is to use it “...as a means of helping learners understanding the meaning of new words, or semantization” (p.426). These ideas provided a point of wonder for further research on the benefits of using Spanish specifically to build semantization in Spanish speakers and support positive semantic transfer into English.

Irujo (1986) investigated whether the first language (Spanish) would influence the comprehension and production of idioms while acquiring a second language (English). This

enlightened my research question regarding how to support positive transfer because it specifically researched the relationship between idioms similarity, analyzing Spanish and English idioms. The categorization of idioms according to similarity between two languages done by Irujo appeared useful to inform my inquiry in regards to how it looks like to support transfer when teaching idioms. How I can discriminate the teaching progression of idioms according to my students proficiency growth. This is an approach to back positive transfer to English, supporting academic language development in terms of comprehension and production. By facilitating the learning of idioms according to how transferrable they are, I could use a contrastive approach to make visible the similarities and differences between both languages to avoid negative transfer or interference between languages that leads to negative transfer; at the same time attending to the level of understanding and production an ELL can attain and benefit from. I could tie this idea to previous studies that urged the use of the first language to support positive transfer (Duran, E., Shefelbine, J., Carnine, L., Maldonado-Colón, E., Gunn, B. & Carnine, D., 2003; Hudson, R. F. & Smith, S. W. 2001).

It is true that I cannot transfer James' findings (2007) to my research scenario due to his study's transferability issues caused by the specific scenario, context and sampling he used in his inquiry. However, this study added a point of wonder for future research on the role of motivation in transfer, applied to Spanish-speakers. Despite the fact that I cannot make any definite statement about the implications this study posed for my classroom, I can speak from my personal experience as a Spanish-speaking ELL to address a couple of the eight categories James extracted from his data analysis. I have a first-hand experience with two of them; specifically, perceptions about competence, and attitudes toward learning outcomes. I can relate to these two because in my experience they have the potential to affect an ELL's production and potentially cripple, or slow down language development in the target language (English). I consider James's categories as a good starting point to further my research on motivation as a factor that might affect transfer, either negatively or positively. It is also interesting to note that James found little data on real motivation for transfer, identified by him as a combination of desire, attitude and effort. This also provided food for thought regarding future research on motivation since the lack of it in his findings might suggest that transfer needs to be taught directly in order to happen. In other words, unless transfer is a concept that is openly discussed in the classroom, and encouraged, students do not transfer learning or skills to other contexts automatically. This is not a new idea according to several studies (Perkins, D. N. & Salomon, G. 1988; Duran et al. 2003; McKeough, A., Lupart, J., & Marini, A. (Eds.). 1995). I believe the fact that the idea of making transfer visible spoke to my research question providing ideas to support transfer in my classroom. At the same time, the also recurrent idea of metacognition is mentioned by James (2007) in this study, but also addressed in several others as a key component for the occurrence of transfer (Bransford, J., Brown, Ann L. & Cocking, Rodney R. (Eds.) 2000; Engle 2006). In addition, metacognition needs to be part of my classroom routines in order for my students to visualize their own learning and become motivated to transfer their learning to other contexts outside the classroom.

Carlo (1991) research findings could not be applied to my population or teaching scenario due to sampling issues, like in previous studies (Saegert, Kazarian & Young, 1973; Jiang 2004). The population sample does not resemble the population I target in my research. Nevertheless, like with the other four previous studies, I can still extract some value from the author's conclusions in relation to supporting the use of bilingual education to promote transfer in English as a second language (ESL) classroom. In addition, using Spanish to develop CALP in my classroom reinforces the idea

that *literacy transfer* happens between Spanish and English, as well as enhancing second language acquisition (Duran et al. 2003; Perkins, D. N. & Salomon, G. 1988).

**Implications and areas for future research.** I started this research wondering about ways to support academic language development using transfer in a Spanish-speaking ELL classroom. The answers I found in the studies revealed limitations and questions for future research as well. The limitations referred to sampling in all the studies reviewed. The studies either focused on adults and international college students attending American Universities, or on elementary children who had academic language already. All the case studies critically annotated focused on students who already had CALP in their first language, or were involved in some type of formal schooling conducive to acquire it. The population I identified for my research not necessarily possess academic language in Spanish. Some of them may present gaps in their academic gaps due to immigration, or the migrant nature of their parents' job (Malagon, H., Mc Cold, P., Hernandez, J. (2011, January). Some of the students included in my target population might even appear proficient enough because I can speak both languages but they are not academically proficient in none of them. A future study research is needed to hone ideas to help older students who do not have CALPs yet in any language. Another point of ponder that requires future research is whether you could use BICs in Spanish as a foundation to build CALP.

Implications for the classroom point to the value of using the dominant language to provide comprehensible input and access points to support learning. Furthermore, prior knowledge must be accessed so students can make connections between the new content and prior learning to enhance understanding. Once students understand what they are learning the chances to transfer that knowledge increases. Concurrently, metacognitive routines must be put in place in an ELL classroom to make not only learning visible but also the knowledge and skills already in place that can be transferred to the second language.

This research pointed repeatedly to the value of teaching academic language in Spanish; however, research needs to be done about possible time constraints for using only Spanish to develop academic language. The benefits of using of both languages simultaneously for instruction with the goal of using only English in the end presents another possibility for future research as well. ELL classrooms emphasize the acquisition of literacy skills, paying special attention to the development of academic language as a central requisite to exit students of the ELL program, and transition them into the regular school classrooms with an array of literacy skills and tools to succeed academically. In addition to these considerations future research calls for sociolinguistic implications related to language transfer. The focus should not only include transferring similar sentence structures and words with equal meanings, but also to attend to the usage and cultural appropriateness of the language that is being transferred.

## **How Student Metacognition Can Support Transfer**

*by Amanda McGall*

The purpose of this investigation is to address how students' self-monitoring and metacognition is used to influence their ability to transfer skills and knowledge. Transfer has been described as "the ability to extend what has been learned in one context to new contexts" (Bransford, 2000, p.51). Bransford and Schwartz (1999) extended this description by adding that transfer is also about learning

for preparation for future learning (PFL). The idea that someone has to transfer what they know does imply that they then have to recognize similarities or points of connection to make use of prior knowledge and strategies. By recognizing and recalling, they then have applied certain kinds of valuable thinking to have understood and applied learned knowledge and strategy to other situations or tasks requiring the transfer (*transfer tasks*). One of the kinds of valued thinking that supports transfer and that is the focus of my research is student metacognition. Metacognition has to do with student self-awareness, self-monitoring or regulating, and it deals with the extent to which students are able to declare what they know, understand, or need to know. While researching optimal conditions for transfer and thinking about how a learner identifies what strategy or knowledge to apply to the new situation for transfer, student metacognition appeared as a way for students to identify and test strategies to prepare for future learning and new learning.

Bransford and Schwartz (1999) described two conditions for metacognition's role in transfer. The first being an ability to self-monitor and reflect in order to improve strategies for learning and problem solving. The second is to monitor one's own understanding of the task in order to assess preparedness for the task. Students who have opportunities to practice self-monitoring then have a powerful tool to acknowledge what they know and comprehend in regards to what they are being asked to learn and do, including self-assessing one's preparation for future learning (PFL). Additionally, within the research and my personal response to my inquiry I am making connections to the learner's memory, including how through self-monitoring the brain makes decisions to apply information or a strategy. However, in sticking to my research question and staying within the groups' larger question, the focus is on strategies that support student self-monitoring and metacognition. Including, metacognitive strategies that teachers can utilize to facilitate transfer in the classroom. And to be clear, metacognitive strategies apply to learning in general; as described by Zull (2002), all learning begins with transfer as students bring their prior knowledge to the new situation or context.

To begin answering my question, I began by looking into the types of conditions and situations teachers designed to support transfer in their classroom; all the while keeping in mind that for the transfer to occur the learner has to have the ability to know what skill or knowledge must apply. On this path I found definitions for different kinds of transfer (*near, far, positive, negative, overzealous*), and that metacognition was approached in a few ways. Metacognitive strategies were referred to as *student reflection, self-awareness* and *self-monitoring*. The search terms I focused on were transfer, student metacognition, self-monitoring and awareness, teacher practices and memory. I felt these terms were directly applicable and my plan with addressing memory was that I would encounter how students make sense of information or encode it for future recall as a way to be prepared for future learning. This work was informed by the general research on transfer and how students develop schemas and concepts, make sense of them, and how to remember or learn them in such a way that they are recalled and applied in a new situation. Another way of describing this is that some concepts can support the recall of other related concepts (Halpern, 1998).

The studies I have reviewed use student metacognition with varied purpose and outcome, and they address my inquiry through a few avenues. They are all quantitative, with one qualitative; they are phenomenological, experimental and quasi-experimental. The following studies I have reviewed tell a story. Starting with practices and roles teachers can take on to support student metacognition and transfer, I then address how traditional instructional practices can use student reflection and metacognition to raise students' level of skill and practice. In addition, students can use metacognitive

skills across different or related tasks to increase readiness and preparation for future learning. In this way metacognitive strategies are transferable. And finally, I review how student reflection can impact memory, and in the case of the studies reviewed unconscious transfer.

The limit of my research reviews may reside in the fact that there are only five studies and that they tend to take place in university settings, though I have reviewed two studies that do occur within public schools. With all that in mind, I am advocating for their relevancy in public schools because their findings attended to students' being self-aware in their educational experience. They also speak to how a teacher may choose to make informed decisions about the design of their metacognitive strategies for the benefits of their students' learning and transfer. And, according to the research I chose not to include in my reviews, teachers who are struggling to improve student performance have used metacognitive strategies to improve both the effectiveness of their instruction and thusly their students' ability to participate in their own education experience (Avila & Baetiong, 2012).

The following sections contain the reviewed research, followed by my conclusion that includes both implications and questions that come up as a result of the nature of this work along with next steps as a humanities teacher.

**Developing effective practices that support metacognition and transfer.** In this article Leat and Lin (2003) described the context for their phenomenological study as “teaching thinking” – with this they had multiple purposes they wanted to engage and measure within their study. The first purpose being to understand the impact of practices and roles teachers can take on to support students' metacognition and transfer in the classroom. The researches described how their thoughts about both transfer and metacognition from an instructor's perspective were informed. Having cited both Mayer and Wittrock (1996), the researchers described transfer as having to do with prior experience and knowledge affecting the learning and problem solving in a new situation and that “effective instruction ensures that students select relevant information, build internal connections between task information and build external connections to other contexts and subject matter” (Leat & Lin, 2003, p.386). They then described metacognition in the classroom as when “teachers help pupils develop a knowledge base about their processes, that explicit learning strategies are added to it and that pupils are encouraged to engage in self-monitoring” (Leat & Lin, 2003, p.387). Another purpose was how teachers can effectively engage in research and a professional learning community (PLC) with other teachers as researchers. For the purposes of my question I will only be addressing the investigation into the first purpose, which was through a constructivist approach four teacher-researchers and one university researcher conducted a qualitative investigation in order to understand good teacher practices that attend to student metacognition and transfer in the classroom.

As teachers who took a situated approach to learning in the classroom, and who were dealing with newly implemented common core in the British schools, these teacher-researchers were the ones interested in supporting metacognition and transfer with their students. And so, the four of them and one university researcher designed a process around the notion of being involved in a PLC. Their own classrooms made up the convenient sample, and the process involved the teachers rotating around to observe and interview each-other's classes. The observations, video-taping and interviews were conducted by a visiting teacher, and they were allowed and expected to share information about themselves to establish trust with the students. The observations and statements from the interviews were qualitatively assessed and categorized. The practices were observed, described and then categorized into one of eight strategies if they were observed in at least 3 of the 8 lessons, and

categories appeared as the observer counted how many times a particular practice occurred within a learning session. With regards to the interviews, these were *debriefing* sessions. Debriefing is a reflective process that the teachers taught their students to engage in and “broadly” define as “small group or whole class discussion, undertaken after learning activities and designed to encourage pupils, consciously, to explore and extend their learning” (Leat & Lin, 2003, p.388). They described that debriefing and similar reflective processes are “essential if pupils are to develop self-regulation and metacognitive awareness” (Leat & Lin, 2003, p.388). There were ground rules regarding the questions; probing questions as were references to specific parts of the observed lessons were allowed, and leading questions were not permitted. From all of this the specific practices or teacher roles were found effective and were divided into groups that supported student metacognition and/or transfer. Teacher roles to support an environment conducive to student metacognition were *Managing Discussion*, *Making Pupils Explain Themselves* and *Providing Feedback*. The next set of roles were labeled as doing two things, and they brought more “cognitive resources” to the situation that in turn increased what a student understood as choices to complete their tasks; the first role was *Collating Ideas* and the second was *Providing Heuristics and Alternative Representations*. The third set of roles supported transfer, these were *Using Stimulating Strategies*, *Attending to Groups and Individuals*, and *Encouraging Pupils to Ask Questions*. The final two roles were *Making Connections* and *Communicating the Purpose of Lessons* to support transfer.

The results are transferable to my investigation and I can legitimately draw conclusions from this study. The results indicated that there were practices or roles the teacher could take on that were effective in the classroom dedicated to transfer and student metacognition. In determining those results, the researchers were thick in description of their own methods that support their findings. These descriptions include using previous research (Hammersley, 1992; as cited by Leat & Lin, 2003) that speak to and rationalize their thinking, purpose and application of design of their student perspective centered investigation. There were member check-ins and transparency about their methods, their situated view of learning and their intentions. While I have concluded that the results of this study are not by chance, the sample was small and there are other elements within this body of work that impacts my ability to draw particular conclusions. While I am making connections with the fact the teacher-researchers are interested in finding best practices to meet the demands of their newly implemented common core standards, they were also members of a particular group that were invested and committed to transfer and learning. They were motivated and interested in making the work they do successful for their students and their ability to call attention to what is effective could be evidence of the time spent working with the students in these roles before the research began or skewed by desire. There are some questions about the students themselves as they are mostly undescribed, including their previous experience with debriefing and metacognitive strategies with the current or a past teacher. In addition, the interview groups consisted of 3 to 6 students who were chosen based on interest and comfort level with being interviewed post-lesson by the visiting teacher-researcher, thus the sample was convenient and skewed. This could introduce variables that include interest, confidence and ability to communicate understanding. I also question the fact that initially there were twelve planned observations and interviews, but only nine observations occurred due to conflicting teaching schedules; the observations themselves are limited in number and time. Time may be important in building metacognitive strategies.

As a humanities teacher who will be working with material across disciplines, my question of how student metacognition can be used to support transfer in the classroom is interesting and

purposeful. Transfer is important and essential and metacognitive strategies support students naming and defining the purpose of the work done, as well as recognizing the thinking that can transfer across various tasks; including, the thinking-types that support understanding, making connections, reasoning, analysis, and problem solving (Ritchhart, 2011). Metacognition and transfer in the classroom have an important relationship. The thinking-types listed, including the debriefing is something I can try out in my own classroom to inform me of effective roles to support transfer and student metacognition with my particular student group. With that said, all classrooms are different, as are the students. Though, teachers have certainly tried out methods based on one observation on what has worked for a colleague. With the detailed reporting of what they did I can replicate some of the specific questioning techniques that support student metacognition and therefore transfer.

After looking at a series of practices and roles, I am moving on to more direct descriptions of implementation. The following review focuses on one strategy in particular, one designed to support novice writers thinking like experts.

**Supporting independent and expert thinking through reflection.** As described by Bransford (2000), transfer is improved by students who are more aware of their resources and strategies, and who can self-monitor for readiness to complete a task. Specifically, he states that “metacognitive approaches to instruction have been shown to increase the degree to which students will transfer to new situations without the need for explicit prompting” (p.67). The following study’s focus is on student metacognition and independence in writing and in particular, its ability to prepare students for writing across different genres and purposes. Researchers Scardamalia, Bereiter and Steinbach (1984) designed this study to measure whether it was possible for elementary (novice) writers to independently carry out a constant reflective process (consistent with experts thinking) during writing. The authors described their experience and understanding in that it was common practice for novice writers to receive instruction they called *knowledge-telling*, that was directed towards developing an internal dialogue focused on what to exactly say and what to say with their audience in mind (a rhetorical dilemma). The authors described that there was little research to support the idea that students internalized this dialogue. With that said, the point of contention the authors had was that this method was also not consistent with what experts do when they write. In fact, rather than a dialogue process the authors proposed a problem solving protocol that brought together two internal facets of writing. The first being content (*What do I Mean?*), and the second being rhetorical (*What do I say?*). To accomplish their goal, they designed a quasi-experiment to investigate this possibility. They observed and described much of the context and understanding around what students did and said; though, the results were measured quantitatively through-out the different genres of writing through the use of blind-coding and rating.

The authors cited Flower and Hayes (1980) in their description of the reflective process they taught to a convenient sample of two classes of 6<sup>th</sup> graders. One class operated as the control, they received typical instruction focused on internal dialogue. The second class received instruction that focused on the students developing an independent reflective process that involved thinking protocols and connecting both their understanding (content) of what they intended to say, and how they write what they understand (rhetoric). This was a process informed by Flowers’ and Hays’ (1980), Dual Problem Space Model. This was taught by the researchers themselves, the instruction took place over a period of 15 weeks, in two 45 minute periods a week. The instruction involved three specific types of support relevant to the study. The first, *procedural facilitation*, focused on modeling and then facilitating planning cues and the kinds of thinking that needed to happen, such as “an

important distinction is...” The second, *modeling thought*, happened both at the instructor level and peer-to-peer while using and not using cue cards. Finally the third, *direct strategy instruction*, dealt with conflict resolution. The idea of dialectic was explained, and conflict was approached as both what students want to say and how to write it. Students were explicitly urged to find a way to reconcile inconsistencies, such as how to include a specific point and hang on to the current structural plan. There were two genres of essay written by both student groups, opinion and factual expository. Students wrote pre-test and post-test opinion and expository essays with assigned topics, and an expository with a topic of their own choosing. While composing the essays, six students at random were recorded while they thought and planned aloud.

The researchers gathered results on planning and reflectiveness, and the major essay and changes between the pre and post-test. In regards to planning, to gather and measure results, the researchers referred to Flower’s and Hayes’ (1980) description of the planning process that focused on content and rhetoric and the linking operations of generating ideas (content). Goal setting and organization became the categories for the thinking aloud planning protocols. The planning and reflective categories were blind-coded and coders would mark statements made by students, including marking statements that were considered reflective. With the major essay, two raters were assigned to rate the essays. They were unaware of which essays were pre or post, and they were not looking for what was a good or bad essay, but what stood out on a nine point scale from *knowledge-telling* (1) to *reflective* (9). With the possibility of bias being controlled for by bringing in blind coders and raters, from all of this the results indicated that the students were capable of independent expert thinking, but with exceptions. While overall there were large differences between the treatment and the control group, with regards to reflection and making connections between the content and the rhetoric in writing for different genres and purposes, the treatment groups reflection focused more on individual ideas and somewhat on sub-goal setting with structure. So, less reflection on rhetoric. Which is a shift away from what the researchers first referred to with knowledge-telling strategies; though, in this case researchers were not wanting one to be out done by the other.

The results of this investigation or study are generalizable for few reasons. In connection with my question about metacognition supporting transfer, this method did show results and applicability to classroom instruction. The quantitative results of the study showed that students were able to reflect individually and that there was consistent change (and significant difference) in the writing across genres (positive, near transfer) from the group of students that received the treatment, (instruction for the expert writing prompts regarding goals, new and improved ideas, and coherence). In regards to the sample, the grade level of the students is adequate for me to apply to my own future 6-12<sup>th</sup> classroom. Though the sample was small and there was no description provided about the students themselves other than their performance during their 15 weeks in the study; 15 weeks seemed to be ample time spent on developing a metacognitive strategy. And finally, the authors then make suggestions and offer analysis of their observations and what the results could indicate, including the real time that self-monitoring takes to develop. They intended to follow up on both groups for another couple of years to observe long-term affect and change. Having included this information lends more trust to the generalizability of this study. It indicates both the idea that expert thinking takes time to develop and that with novice writers there is not a quick fix. Though they can carry out independent elements of a metacognitive task, the teacher still needs to scaffold and support high levels of expert thinking to see long-term affect. Also lending to the credibility and internal validity, the researchers triangulated their methods and results, though with their own prior research.

When making informal observations about the results Scardamalia and Bereiter (1982) were cited when describing the students' skills with the dialectal or reflective process.

As a humanities teacher questioning metacognition supporting transfer, instruction in writing across different genres for multiple purposes does occur; writing is a tool for explaining what we know and understand. This study makes me think about those specific moments when students can think about and understand the writing process as this. It is them thinking, understanding and then crafting a response that attends to both what they want to say, and how to say it. And, with the humanities in mind, there are different genres of writing that do require students to repurpose the writing tools, techniques and understandings they have. Thus, in regards to transfer, the problem solving protocols that this kind of reflection attended to could be applicable to various genres of writing, as well as other types of text crafting, including speaking and visual. In regards to metacognition, I am now thinking about how students can use a reflective practice in writing and problem solving to confirm what they know and understand along with what they do not. Specifically, if and how they can identify where their prior knowledge and preparation for future learning meets the demands of the task, or falls short. In addition, a metacognitive reflective process takes time to learn, and requires scaffolding and a safe learning space to cultivate thinking aloud protocols. With regards to this study, the teachers were nervous about implementing public instances of thinking and questioning (thinking about how the students might feel); however, it was described that the students enjoyed it. I wonder if perhaps because it normalized confusion and questioning. An additional connection includes another case study where researchers (Hart & Albarracín, 2009) investigated students using the *imperfective* (verbs ending with an *-ing*) when reflecting, as it had shown to improve memory and future recall. In this study the problem solving protocol is a conversation that involves setting a series of sub-goals and making connections between writers' content and a rhetorical dilemma. It is focused on understanding what they say and do, and I wonder if incorporating the imperfective verb aspect would support recall and transfer to future writing projects.

With this study I thought about how in other research, researchers (Butterfield & Nelson, 1991) used metacognitive strategies with students in two different groups to support independence and support them to the point of being able to transfer in tasks that worked with concepts of dimension. I also made connections to Bransford's (2000) descriptions of novice and expert, as well as wondering about what student metacognition is from the students' perspective. With that in mind, the following review is not a direct look at students' perspectives, but it does do some work in the direction of recognizing that student's informed or self-informed ideas about what they know, think they know, and what is effective for their learning can be short sighted and false.

**Memory and students self-monitoring of what they think they know.** Retrieval is recalling or remembering, and researcher Karpicke (2009) questioned whether or not students saw or understood its value. In addition, he questioned the role of student metacognition. If students focused on one way to understand retrieval's role in learning, then could their thinking lead them down a false path in understanding how they learned and whether or not they had learned. The researcher's investigation had three purposes. The first being what effect retrieval had on learning. The second was how students' monitor and regulate their own learning; and finally, students' decisions to practice retrieval. With a post-positivist's approach they conducted a quasi-experiment with four studies, or what the researcher refers to as experiments, with a control group. The data was gathered and reported quantitatively, both in terms of reporting from one experiment to the next, and making a

comparison of results to determine validity and next steps in the design of the experiment that followed. In this way he was able to build on some of his own results with multiple experiments.

Karpicke (2009) conducted four studies in which student metacognitive awareness during a learning activity and metacognitive control over a study process was evaluated through the use of a computer program that had students learning and practicing 60 Swahili-English word pairs. The convenient sample was made up of undergraduate university students who were earning credit for their participation. None of the same subjects participated in more than one experiment, and there was a total of 150 students across all four experiments. What was observed and tested were students' abilities to recall and make decisions about what they thought they had learned, including self-monitoring of what would be most effective for learning. The use of the computer program varied slightly depending on the purpose, though overall the program introduced the vocabulary and provided choices to support students' ideas about how they thought they were learning. The choices included studying or rereading, recalling or just dropping the word when deciding they had learned it. The system's focus had students learning their vocabulary through something like flash cards. The four experiments systematically built on one another. The first and second experiments addressed students' *judgments of learning* (JOL, or what they thought they learned) and a specific study strategy (retrieval or rereading). Experiments three and four addressed the participating students' chosen study strategy as it was compared with what was actually successful (retrieval was more effective than rereading the information, though students through metacognition identified the opposite). Across all four experiments the participants were asked to monitor their progress, assess their learning and self-select a learning strategy. These in turn were *judgments of learning* (JOL). The subjects JOLs were compared to their performance. Meaning, when they thought they had learned something they actually had not. Additionally, what they thought would support their learning, in fact, did not.

The findings, overall, indicated that retrieval was the most effective method for learning. The more times information was recalled, this increased the probability that it would be recalled in the future. However, if a student was able to recall something once or a few times then they tended to believe that they had learned it. They then stopped practicing retrieval, and the information was lost to memory decay. Students who then believed they had been effective in studying and learning, struggled when recalling or retrieving later on. At the start of this study the participants were questioned about study methods, including the practice of retrieval. They considered it the least successful method of learning; however, retrieval was in fact the most successful at supporting the subjects' ability to learn.

The results are generalizable for my investigation's purpose. Conclusions can be drawn for valid reasons. First, in regards to internal validation, the researcher applied other resources and research they had conducted to developing their purpose and informing the design of their study, (Roediger & Karpicke, 2006a; as cited by Karpicke, 2009). Additionally, there was thick description of the methods and results, and the researcher addressed what would be a relevant discussion regarding the results and the next steps. The researcher was upfront about their understanding that they are in territory that required more attention and research to be done. While this was initially stated as a guiding reason for doing the work they did, they also addressed that this is why more needs to be done. The elements that go unmentioned in this work and that challenges my ability to draw particular conclusions for my research project includes the lack of learning history of the participants themselves, who were also in college. Though, the researcher was transparent about the factors for their involvement. Additionally, this study investigated retrieval or recall. While in transfer

ideas do need to be retrieved, retrieval is not necessarily higher level thinking, something that transfer involves more of (Leat & Lin, 2003). I have already mentioned that there was not explicitly a control group; though, for the purposes of the research about what students think is effective and student metacognition, a control might be irrelevant. One of the things that supports trust with this research is the openness about moving from one experiment to the next because of an alternate solution. And in closing, the researcher questioned cues that might have supported the retrieval measured, noted as the *potentiating effect* (Koriat, 1997; as cited by Karpicke, 2009), but for the purposes of the investigation they called on other research including their own (Roediger & Karpicke, 2006a; as cited by Karpicke, 2009) to support the value of retrieval in learning.

With regards to metacognition's support of transfer, I am thinking about both retrieval and students ability to misjudge what they know. According to the results of the study, if students and learners self-deceive or have illusions about what it means to have learned something then this is something to address in the classroom when designing metacognitive strategies and transfer tasks. As a humanities teacher I have to wonder about and incorporate what my students think they already know when it comes to engaging them in the classroom. This includes the kind of skills I will support my students developing so that they may have continued success in learning and transfer. At this point, it is interesting to apply students' self-judgments of learning to what is really being learned. This particular study practiced student metacognition and self-regulation in an unhelpful way. Thus, it was implied that student metacognition and self-regulated learning required support from instructors to guide students to beneficial practices. Either in terms of preparation for future learning or background knowledge that could support a situation calling for transfer (a transfer task). And, while this body of work focused on student metacognition and not transfer directly, I do make some connections. Transfer tasks do involve students recalling ideas and concepts, or recognizing and recalling similar underlying structures for transfer. Thus, recall and memory are involved in the ability to recognize, and students develop a schema about what it is to learn and to study. Having to change that schema may be necessary if students need to develop more sustaining ways to learn and transfer in the classroom and beyond. Adding transparency and self-monitoring skills to doing what we do and why they will empower the learner and reduce confusion and obfuscation when it comes to learners making decisions.

**Memory and reinstating a past behavior.** Informed by past research (Carreiras et al., 1997; Magliano & Schleich, 2000; as cited by Hart & Albarracín, 2009) on how narrative comprehension that had indicated a choice of verb aspect affected memory, researchers Hart and Albarracín (2009) investigated how verb aspect affected students' abilities to recall a strategy for future use. The researchers' starting hypothesis was that those who reflected on and described an event or situation using the imperfective form of a verb (ending the verb with an *-ing*) would later recall and reinstate a past strategy or behavior in a subsequent task. Four experiments were designed to test and quantitatively measure some aspect of this; however, for the purposes of my research question I am focusing on the first experiment for this review and the third experiment in the following annotation. For the first experiment researchers questioned and tested to see if reflection using the imperfect verb aspect would affect students' abilities to continue use of a strategy for future use.

Through a post-positivist approach the researchers designed an experiment with two parts, with student reflection in-between. The convenient sample was made up of 56 introductory-psychology students who had no awareness of the experiment's purpose. Following the first part of the experiment half of the group was randomly assigned to reflect in the imperfective, the other half

was assigned to reflect in the perfective. Experiment 1 examined if using the imperfective, rather than the perfective to describe prior avoidance of the writing with reference to the African American stereotype would result in exhibiting less stereotyping on a future task. The hypothesis was that describing a past action (stereotyping) with the imperfective enhances the tendency to continue the action. Specifically, participants were to avoid stereotyping in one task, reflect on how they did that, and then perform a second task that quantitatively assessed for how much the individual did or did not practice stereotyping (a cognitive task). To begin, participants wrote a short essay about an African American man's typical day, having been told that descriptions of people were being collected. They were then randomly assigned to reflect on and describe their behavior during the task using the perfective or imperfective. The students were taught about writing in the perfective and imperfective. Following this, participants were asked to then make judgment calls on a scale of 1(non-hostile) to 10 (hostile) about the hostility of a person who had been described in terms that were stereotypically assigned to African American men. Participants were then debriefed and questioned for awareness of the purpose of the task. Participants were not aware of the purpose of the follow-up task and presumably they made no connection that their previous action or behavior was expected to be transferred to the new task.

The difference between the numerically scored performances of the two subject groups (perfective and imperfective) were compared and there was a significant difference between the two. The participants who used the imperfective in their previous self-descriptions of avoiding stereotypes reported lower hostility ratings than the perfective participants. Thus, the results supported the hypothesis that a past action or strategy for avoiding stereotyping was enhanced by using the imperfective.

The results from this study are generalizable. There are ideas this study speaks to that allow me to legitimately draw conclusions for my investigation. The first reason being that participants who did not write complete phrases, write a reflection or use the correct verb aspect had their results eliminated. In addition, the results from this first experiment also became the focus of the second experiment; to check that it was memory that was affected by verb aspect (as their initial research had described, but they wanted to confirm more than just continued use of the action) by introducing a time component. The second study did confirm that memory was affected. There are elements about this experiment that make me pause and question what connections I draw from it. Firstly, though students were not aware of the task's true purpose, they were involved in something that they may have felt motivated to carry out simply by being involved. There was no control group, no description of member check-ins, though there was informed discussion after all of the experiments that described how asking students to write in the imperfective may feel so unnatural that it makes the content of it stick out in their mind. However, they do go on to cite specific research about the relationship between language and thinking, and that "...priming thoughts of an action enhances tendencies to reproduce an action at a later time" (Dijksterhuis & Bargh, 2001; as cited by Hart & Albarracín, 2009).

The data suggests that use of the imperfective verb aspect during reflection or self-description does affect memory, and as a secondary teacher I can consider this information when designing my metacognitive tasks. I think that this study is about effective student metacognition or reflection practices as much as it is looking at how language impacts the brain. I wonder if teachers were to invite or design reflection and metacognitive tools that had students using the imperfective after a learning activity then perhaps students would recall relevant information more efficiently when

performing the transfer task. In addition to this, Karpicke (2012) described how every time information is recalled it is changed because recalling it enhances its ability to be recalled later, thus making learning sustained and more meaningful. So, making the learning experience more memorable can happen in addition to student metacognition and other roles teachers can take on. Though, it should be considered that the transfer type that was involved in this experiment was *near* transfer (involved similar features) and it was expected to occur unconsciously based on how the participants' memory was affected by their reflection (they had no knowledge of purpose). In my own classroom when working with student metacognition and various transfer types I seek to be more transparent about the purpose and function of the work we do to support *positive* transfer, or transfer that happens. Also, as a humanities teacher I can address language and thinking in my classroom. The experiment made use of a specific way of students practicing self-awareness, by reflecting on the use of a strategy to inform a future behavior and action. I wonder about shifting the language tense in class with verbal and written reflection. Specifically, I am thinking that within the realm of designing tasks and instruction to facilitate students' metacognition and enhancing memory to support preparation for future learning (Bransford, 2001).

**Memory and recall supported over time.** In the following experiment researchers Hart and Albarracín (2009) continued to explore how language and specifically verb tense affected students' abilities to recall a strategy for future use. Here, in the third experiment, they described *action-relevant knowledge*, or knowledge that is in the mind's and memory's sense, ongoing and in use. In addition, they were also interested in how verb aspect used to describe behavior affected future re-enactment of the behavior. As the second experiment was based off of results from the first experiment, experiment three was asking a question about the results of experiment two, where the imperfective memory was improved for *action-relevant knowledge*. The thinking was that because the imperfective signals that an action is ongoing, it indirectly activates a goal to fulfill the action. Experiment three was then designed to answer the question does imperfective memory make *action-relevant knowledge* more accessible over time as goal tension builds? Like the others, the results were quantitatively measured and reported, with further discussion to offer ways these finding may be interpreted.

Experiment 3 measured for results in goal mediation or facilitating in goal setting. The hypothesis was that *action-relevant knowledge* should be more accessible over time as goal tension builds. Meaning, that if memory of action-relevant knowledge is goal mediated (activated to fulfill goal) then the *action-relevant knowledge* should be more accessible overtime (no or less memory decay). The convenient sample this time was larger than the first two, 160 introductory-psychology students participated in completing a lexical-decision task (LDT). This involved classifying stimuli as words and non-words, (a common practice in experiment testing). It directly measured memory for *action-relevant knowledge*. Again, half of the group was randomly assigned to reflect in the imperfective and the other half was assigned to reflect in the perfective. Groups were taught to reflect in perfective and imperfective, and they had no awareness of the experiment's purpose. To begin, the participating students first completed an anagram task that afterwards they were then randomly assigned to reflect in the imperfective or perfective. From this the students were then asked to complete an LDT, students were then randomly assigned to perform an unrelated task before or after the LDT (a task that measured *action-relevant knowledge*). When they were asked to complete the LDT after the unrelated task, this introduced a delay in time that could then affect memory and goal setting (mediation), and the participants had been told that the LDT or its word recognition task might

influence anagram performance. So, groups were being observed for the effects of imperfective or perfective, and within those groups delay or no delay. From the results of the LDT, it was found that the participating students who used the imperfective completed the LDT quicker overall, with a significant difference. However, this group when delayed, did not perform quicker than the perfective group. These findings are consistent with the second experiments' findings; the imperfective affects memory, not goal mediation. Students who used the perfective showed very little difference between having been delayed or not, due to overall decay of memory.

The results are generalizable, but there are issues to consider. There are reasons why I can legitimately draw conclusions from this study for my research project. The hypothesis was supported with significant difference between the treatment and control group. To support the validity of Experiment 3's findings, those who could or did not follow directions were eliminated. In addition, Experiment 4 was conducted to cross check that the verb aspect influenced memory not an alternative questioned by the researchers themselves, cognitive activity. In addition, it verified findings of Experiment 2, that memory was impacted by the imperfective, not goal setting or mediation. There are elements within this study that limits my ability to draw particular conclusions for my research project. There is the possibility that participants may have had some prior knowledge in dealing with some of the tasks they were asked to perform. Related to that, additional issues include that there were no descriptions or pretests for prior knowledge or experience with reflections. And, there was very little variety in the tasks that participants performed, and only their responses are reported. I am also taking into consideration that because the researchers are psychologists, the language they used, for example in the first experiment the term *action-relevant knowledge*, had to be translated into terms that I understand as a teacher. This might cause questions about how relatable their experiences are to a secondary classroom situation. In my own understanding, an action or behavior can be those that are involved in learning and transfer.

According to Karpicke (2009), learners who practice recall and retrieval have been shown to improve recall of information for future use, and student metacognition plays a defining role when what is being recalled is useful and applicable. The results of this study confirmed language's ability to impact memory and the ability to recall. Previously reviewed research did the same, with regards to retrieval (Karpicke, 2009). Additionally, that work reviewed students' metacognitive short falls. So in addressing how students' self-monitoring skills and metacognition influences their ability to transfer skills, and in thinking about how those skills are retrieved, I want to design effective metacognitive strategies. I want to design them so that students are making relevant connections, but I am intrigued with how the language we use can impact remembering. I do want to address the fact that language is cultural and personal, and I have questions about how we account for other linguistic groups' verb usage and the impact on memory. However, I am also thinking about how the first language an English Language Learner (ELL) knows is also where their prior knowledge is entrenched within. From that perspective, how does their language shape their memory? And, how can I support ELL students in my classroom with this strategy?

**Summary and insights in how metacognition can support transfer.** The general research for transfer emphasizes changes in schema by teachers providing support to students in their abilities to be flexible in their learning enough to recognize multiple contexts and repurpose strategies, knowledge and understandings that they have in their repertoire. Most notable are the ideas around novice verses expert abilities, (Bransford, 2000; Scardamalia et al., 1984; Butterfield & Nelson, 1991). This topic and research was couched in the idea that young students are treated and instructed

as novices, or learners who primarily recognize or work with surface features. These novices may ultimately spend years recognizing the kinds of underlying features and structures, or strategies that experts are defined by. Within the research and reviews, and within the conditions that were using metacognitive skills to support transfer, novice students were capable of expert moves in learning and specifically being able to transfer. Thus, it was a powerful notion that when the expectation of expert capability is met with metacognitive skills that allow novice students to name and define what they know and need to know, that “novice” students can achieve expert moves. And yes, teachers need to teach metacognitive skills as well as the thinking, and then scaffold for and attend to the gaps that appear, but this is effective instruction and meaningful learning. As described by Leat and Lin (2003), “...the use of challenging pedagogical strategies, an emphasis on shared thinking and reasoning, the use of existing knowledge and the exploration of the application and transfer of learning reduces constraints and changes the learning culture” (p.398).

Other insights included what can be considered barriers to transferring and learning. Admittedly, it may be an odd piece of research to connect this to; however, when students think they know something they may stop doing the work to learn it. As described by Karpicke (2012), students think they know something when they are capable of recalling it. Though, what happens with this situation long term? We can remember something long enough to take the test, but two weeks later it is gone and unlearned. It was also the results of his research that students, when given the choice of how to study, choose what they believe to be an effective method (though it was not). This in turn creates barriers caused by prior knowledge and that I have started to think of as *I will not learn* barriers. It is not the fault of the learner, and it can operate as an unconscious refusal to learn; however, it leads me to a couple of conclusions. First, in general I am thinking about the importance of having curriculum that is informed by students’ prior knowledge. Attending to this supports their ability to make relevant connections and inform their understanding. Second, I am reflecting on the different thinking-types that occur within the content of the curriculum and the social interactions, as well as decision making that students and teachers engage in. These thinking-types are described as ways to support students’ understanding, and keep students engaged and independent (Ritchhart, 2011). To name a few, they are *building explanations and interpretations, reasoning with evidence* and *considering different viewpoints and perspectives*. Not only are they skills that a teacher needs to support with regards to the content, they are skills that students can practice independently when exercising their metacognitive strategies.

**Implications and areas for future research.** I believe the implications for myself as a humanities teacher have implications for my students as preparation for future learning can support what happens in the classroom and what happens once students leave it. As a humanities teacher who will be working with the new Washington State Common Core Standards (CCSS), I am reflecting on ways to develop a pedagogy that values the effective use of metacognitive strategies in my classroom because I plan lessons using the CCSS and I think about how they are a set of skills and ways of thinking and understanding that are developed and extended over a period of time. By asking a student to read for deeper meaning in 6<sup>th</sup>, 7<sup>th</sup> grade and all the way up to their senior year, as a teacher I am asking this student to transfer what they know from year to year with the ideal outcome being that as an adult they have critical reading skills. Thus, from my perspective, transfer has huge implications from day to day activities, and relevance in being an informed adult person.

Looking at the research I reviewed I plan on incorporating written reflection and thinking aloud protocols in my classroom to support my students’ development of metacognitive strategies

when involved in learning and various transfer tasks. Including, being specific about purpose and application, having students use writing as a tool to describe their understanding and be involved in problem solving protocols. I am very interested in metacognition as a tool to support students as independent learners, and expert thinkers and doers; this is a very powerful notion that can support students having meaning and agency in their learning. I want to explicitly teach and monitor my students' ability to self-monitor and self-assess their chosen strategies. From the research reviewed, focusing on this allows students to get to the point of transfer on their own, and continue to develop their self-awareness. Students can do the work of experts; and, it is their metacognition that needs to be used to inform their expert knowledge and skills.

For my next steps in research, I do plan to continue looking into the areas of metacognition and memory. The idea of how students recall information and make decisions about what they know and need to know is interesting as it also informs the decisions made about how students study, apply their working schemas and transfer in future contexts. I see this making connections to students' abilities to understand the purpose of what they are learning as a way to put it in a context that can later be retrieved for future use. Through what is recalled, students can identify goals and define what is known, useful and where there are gaps to fill to prepare them. In addition, I am thinking about the resilience of prior knowledge even when it's wrong. The next problem would concern how to make use of this knowledge. As I suggested with students being able to identify and define, it would begin by declaring or outing the prior knowledge (what they know or think they know) and making sure it was clear how it was limited, even though it may seem like a universal or applicable principle.

Finally, I want to make a reference to transfer and metacognition for myself as a reflective practitioner. One of my values as a teacher is that I have high expectations for my own practice as a way to model for my students having high expectations for themselves. These expectations of myself require that I question and self-assess the effectiveness of my curriculum and instruction, and that I then self-reflect on what I know and need to know in order to best serve the needs of my students. My own metacognitive strategies will be a tool for me to utilize and model for my students as I develop, change or differentiate strategies within my own learning and transferring to be the best for all learners. One of the new terms for transfer I encountered was *overzealous transfer* (Schwartz, Chase, & Bransford, 2012). It is a term that was described as a specific type of negative transfer that occurs, not because a learner doesn't have a strategy or grasp of a concept to correctly apply, but it occurs when someone has overgeneralized or falsely made assumptions about what does apply. Thus, prior knowledge and understanding has created a barrier to positive transfer. For students this could mean that they make quick assumptions and apply the wrong strategy; however, for myself as a teacher this suggests that I may at times be thinking that what worked for me or what had worked in with past students will continue to work for all students. Which simply put, will not be true with the many kinds of learners and teaching content across multiple disciplines. What will matter in this situation, or what will turn this moment into an example of positive transfer, will be when I can name the strategies that require changes and adaptations to the new situation in order to serve my students.

## **Transfer: A Question of Assessment**

*by Victoria Maratas*

My question for this investigation revolves around how I might assess *transfer*. Transfer being the ultimate goal of teaching, I need to make sure that all the measures I take to encourage transfer will work for each of my individual students. If I do not make an attempt to measure transfer, it will be difficult to be sure it is occurring and my students will not understand its importance (Lohman, 1993).

This question of how I measure the transfer of knowledge and understandings is important to me because transfer is the ability to manipulate understandings to fit new contexts – the very goal towards which I seek to send my students (Bransford, Brown, Cocking, (Eds.), 2000; Greeno, 2006; McKeough, Lupart, & Marini (Eds.), 1995). However, transfer around academic knowledge is not automatic for the majority of my students. *Prior understandings* from a student's life are much more likely to be transferred into future contexts than academic understandings that are taught in school unless the "links" that Hickman & Kiss (2010) describe are emphasized between material, classrooms, departments, and future, real-life contexts. Transfer is abstract (Bransford et al., 2000; Perkins & Salomon, 1988). For many of us, transfer occurs without being particularly aware or surprised by it, especially in regards to real-life circumstances where we need to use our prior knowledge and understandings to face a problem.

Much of the time, education in the public school classroom is abstract and connections between information from different subjects or different parts of subjects are not emphasized—rarely is a student ever encouraged to transfer prior knowledge. This does not encourage students to be life-long learners in that, if students are not encouraged to build on their knowledge, or are not aware of this building effect, they will not see the connections between themselves and the knowledge/understandings they are supposed to be obtaining nor will they make the connections that make use of their academic understandings in future non-academic contexts. Thus, this information they are supposed to retain will instead be fleeting and appear and disappear within the blink of an eye as the student has no further purpose for the information they are given than to pass the next test. When I get students to understand the reasons behind transfer, why transfer might be important to them, how I am teaching them to encourage transfer, and how they will be able to self-assess or be assessed on the transfer of different concepts, skills, ideas, or dispositions, then I might get my students to retain the information I give them and make public school education useful to my students' lives.

From doing this research, I hope to learn how I can assess myself and the methods that I employ to encourage transfer in my students. I hope also to learn how I can assess my students to aid my students' understandings of the value of transfer and what transfer feels and looks like. I want my students to take what they have learned and use it in the future—to look at themselves and their place in the world and to make a difference using what they have learned. I believe that teaching for transfer is a way to get students to think about the movement of understandings and to become critical learners around how they receive data, how they process it and that data's worth. To not remain merely consumers of knowledge, eating data and spitting it back out in almost the same shape, but to create new understandings by taking what they know, combining it with what they are learning, creating something new, and then to continue expanding those ideas (Montaigne & Frame, 2003).

The ability to assess whether transfer is occurring is a necessary part of how I might teach for transfer. Although many studies go without explicit mention of how to measure whether transfer is

occurring in students and to what degree, being able to assess my methods of teaching for transfer is a necessary precursor to the argument for having these practices. There are many articles on transfer—why it’s important, how it happens, and methods teachers can use to get their students to transfer knowledge and understandings. However, articles on how to assess students and methods for whether transfer is occurring and to what degree are almost non-existent. That is not to say that I did not find research pertinent to my question, just that it was sometimes difficult to see and required interpretation on my part.

All the articles that I found were peer-reviewed and talked of either assessing transfer or of methods used to affect transfer that were then assessed by the researchers. Sometimes, transfer was not referred to as transfer, but as *fluid abilities*, *cross-curricular links* or *retention* which all have similar definitions centered on the manipulation of knowledge in variant contexts. As there are many ways to refer to transfer and many ways that people differentiate the various types of transfer it was difficult to search for “assessing for transfer” and find the articles that I wanted. Thus, I mostly utilized the sources cited in the group’s articles as I began my individual search. Some authors were more explicit than others about the type of transfer that they were measuring for; others had to be inferred through triangulation to other studies. This inference was necessary due to the variability in types of transfer that can be measured for as, if I am not explicit in naming what I am measuring, it will not be measured (Wiggins & McTighe, 2005).

In my search for pertinent articles, articles specific to assessing for transfer were literature reviews and not studies that looked for specific findings. The majority of the research studies I did find were an examination of the methods one can use to get students to transfer. All researchers, however, had to employ some sort of assessment technique to measure how well their methods of affecting transfer worked. The research studies I have analyzed below ranged from qualitative to quantitative, post-positivist to transformative, quasi-experimental to phenomenological. While I made an effort to find a broad range of paradigms and types of studies, this meant that I rarely got agreement on assessment strategies as the very paradigms these researchers used impacted the way that they collected and evaluated their data on whether transfer occurred in their sample – the focus of my question. Although I do not have any widely agreed upon strategies for assessing transfer, I do feel like I have some assessment strategies that I can try in my own classroom, alter to suit the students and curriculum I have, and feel confident that I am beginning to assess for transfer.

As I began my research, I found a two-sided answer to my question—methods delineating either quantitative or qualitative methods to assess for transfer. The methods of assessment depended greatly on whether the study’s paradigm was post-positivist/pragmatic (an argument for quantitative assessments) or constructivist/transformative (an argument for qualitative measurements). With evidence from both sides in mind, I concluded that both assessment methods could be useful, especially if I kept my future population in mind; as each type of test suits a different type of student and a different subject. A variety in assessment strategies, just like a variety in transfer questions will allow the broadest assessment for transfer – a necessity due to the spectrum of transferability that could occur within my classroom.

In the following sections, a review of my research on assessing for transfer has been provided which includes a summary with my perspective on assessment methods most applicable to my future practice as a science teacher.

**On activity-oriented instruction and transfer.** Moody, Abell, and Bausell’s (1971) study was an examination of whether *activity-oriented instruction* can aid students in learning

multiplication and whether this has a positive effect on *prior knowledge, transfer, and retention*. These researchers performed two quantitative tests to analyze whether their hypotheses were correct using post-positivist, correlational study methods.

The researchers in this study chose 90, 3<sup>rd</sup> grade students from Delaware. These students were of lower-middle socio-economic status with no formal instruction in multiplication. The researchers first performed a pre-test to determine each student's prior knowledge of multiplication and then randomly assigned all students to one of 4 different treatments: (a) *activity-oriented*, (b) *rote*, (c) *rote-word*, and (d) *control* groups. Students were then taught using the various strategies for 4 weeks. It was noted that if a student could not read well, all written problems were read out loud for the student. After 4 weeks, the students were given transfer and computation tests (where no definitions of transfer were provided), which were then re-administered after 6 and 8 weeks after instruction had finished with no multiplication being taught within that time period. These researchers utilized a simple random sampling method to place students into the 4 treatments and measured all the 3<sup>rd</sup> grade students in the district.

Moody et al. concluded with the statement that there seemed to be little difference ( $p>0.5$ ) between students who were taught with activity-oriented instruction or non-activity-oriented instruction in terms of retention or transfer, but that the population was atypical and the sample was not large enough, thus more research was needed to determine validity of the findings.

The researchers in this study measured transfer as a condition to show whether activity-oriented instruction was a useful practice or not. As the researchers wanted to measure transfer, theoretically, I can use this study in my investigation of how, as a teacher, I might measure whether transfer is occurring. Moody et al., however, did not identify their definition of transfer, nor did they identify how they were assessing transfer other than with a "transfer test", ergo, this study has very limited usability. I do, however, acknowledge that this study is an example from which I might draw ideas from, especially in respect to their attention towards the pre-test and their revisitation of the post-test as elements of measuring transfer.

I cannot generalize the findings of this research to my classroom. Although the methods these researchers used were very methodical, objective, and they did put some effort into describing their students' backgrounds, they did not define what they were looking for, nor did they explore activity-oriented instruction in more than one way. If the researchers had defined their definition of transfer and what it might look like in the student's use of activity-oriented instruction and, more precisely, how they assessed how the students transferred the knowledge, skills, and understandings, I believe some of this information could be generalized towards my practice. However, additional factors such as the age of the students and the subject that they taught were not ideal conditions that would show measurable evidence of transfer or retention. Potentially, some of the methods could be duplicated with alterations to fit my classroom and my style of teaching. I would like more evidence from other articles around the use of pre-, post-, and delayed post-tests to understand and be able to show evidence for these methods as practical methods of assessing for transfer.

These researcher's findings can likely be trusted as the methods are described, attention was given towards the population, and the authors do point out several limitations in the generalizability of their findings. However, the lack of detail that has already been referred to brings questions to mind about what the data actually measures. Since I am not sure of what is actually being measured in this study, I would not put any emphasis on the results that indicate that activity-oriented instruction is no better or worse than rote instruction.

This study aids me in my question of how I can assess for transfer in that it describes a pre-, post- and delayed post-assessment method that I feel could be useful to show student growth. As of yet, there is not enough evidence to make use of this method; however, in the following article, I found additional evidence that backs up this use of the pre-, post- and delayed post-test method with evidence that is observable by the reader, has a definition of transfer, and shows examples of the transfer problems explored by students, and in later articles, samples of students closer in age to the high school students that my group will encounter.

**On problem solving tutoring and transfer.** In this research article, Fuchs, Fuchs, Hamlett, and Appleton (2002) explored the effectiveness of *problem solving tutoring* with instruction that involved teaching *problem-solution rules* and *transfer* to 4<sup>th</sup> grade students with learning disabilities. This research followed a pragmatic, quasi-experimental approach as they explored multiple facets of their question through the use of quantitative research that took the form of a measure of *student growth* through summative pre- and post-tests.

The researchers identified their students through an intensity sampling method as they discovered their subjects from intelligence tests and received notifications from special education teachers. From this came a sample of 62 students from 3 schools in the Southeast of the United States. Of these students, only 40 moved on to continue the study after a *Test of Computational Fluency* was performed and only students who scored below 1.5 standard deviations from the norm were accepted into the study. The researchers then sorted these students into 4 groups using stratified random sampling so that 10 students into each group: (a) *problem-solving tutoring with computer-assisted practice* (with an emphasis on both *near* and *far transfer*), (b) *computer-assisted practice* (emphasis on *far transfer*), (c) *problem-solving tutoring* (emphasis on *near transfer*), or (d) *control*. In each of these groups, there was an awareness of the potential for non-homogenous groups to have an impact on the external validity of the data, thus ratios of females to male, subsidized lunch to non-subsidized lunch, African American to non-African American, Euro-American to non-Euro-American, Hispanic to non-Hispanic, ELL to non-ELL, and problematic class behavior to non-problematic class behavior were recorded in each group. The research phase then began with a background unit in an attempt to have students approach the study with similar knowledge. Further background units were given to the students in the three experimental groups to get them used to the skills, teaching styles, and approaches they would need to utilize in these subgroups. All lessons given were scripted (but not read) to aid as a control for the 4 groups.

Fuchs et al. assessed student growth in terms of transfer with the use of two forms of a test with different questions on each at the beginning and at the end of the study. Since there were two forms of the test, each group was split into two and each half given a different form of the test as a pre-test, and at the end of the study, the forms were switched for the split groups for the post-test. Thus, every subject took two different tests to measure growth and, to allow less error in instrumentation, both had forms as pre- and post-assessments. The study also gave some detail toward the type of questions they used in their pre- and post-tests: (a) *story problems*, (b) *transfer story problems*, and (c) *real-world problem solving problems*. These transfer problems were, in effect, a movement along a continuum from near to far transfer. These tests were then measured by scorers not associated with the study using a rubric.

The researchers found that, overall; the two groups with problem-solving tutoring (an emphasis on rules and narrow transfer) showed statistically significant mathematical problem-solving growth. They also found that the two groups of students who had focused on far transfer through the

use of computer-assisted practice did not have statistically significant growth, but did show some progress. The researchers note that future research is needed with larger sample sizes. The researchers then triangulated their research to research from past studies and other researcher's studies to situate it within the context of transfer and students with learning disabilities.

This research is pertinent towards my research concerning how I measure for transfer in that, even though there is not quite enough detail to replicate their evaluation methods, I am given a basic outline of their methods for analysis. Normally, the pre- and post-tests that I am encouraged to give are the same test so that I can compare with direct evidence to show student growth, but this easy comparison comes with the drawback of my students becoming test-wise and, perhaps, looking to outside sources to do better on the post-test, affecting the results. This research, however, employs the two-form assessment method as pre- and post-test which has the potential to make measurements of growth more reliable measures for transfer. When I measure for transfer, by definition, I cannot give students the same questions as they had on the pre-test, otherwise I do not know whether they are transferring their new knowledge or memorizing the answers they think to be correct from the pre-test. Transfer necessitates movement and my adherence to static measures of growth is unreliable at best.

The question types these researchers used could be useful for creating transfer questions surrounding near and far transfer and are measurable in this context. If I teach my students to be aware of these categories of questions and then use them to measure my students' progress in transfer, I can get my students to focus their attention on transferring their knowledge and understandings towards outside future situations.

The researchers did identify several issues towards internal validity that should be kept in mind when I consider the generalizability of these results towards heterogeneous students with learning disabilities such as: the teaching being done by the research assistant who was not an experienced teacher and the difference between tutoring and teaching with tutoring having an explicit focus, many examples, and peer to peer help. Fuchs et al. also identified issues that would affect external validity in that, this was a small sample (10 students per group) and some students had other learning disabilities including math, reading, and other disabilities that should have been controlled for. The sample also involved only 4<sup>th</sup> grade students, which are a different population than the high school students I wish to teach. Overall, I believe I can generalize many aspects of this research, although I would have preferred a larger sample size and more controls as to type of disability. Through the thick description provided, I can trust their methods, and, with triangulation to other studies, this study is likely not a fluke.

Fuchs et al. are focused on making students aware of transfer as the goal in classrooms-that the information they learn here can be applied elsewhere. This awareness seems central to the progress of science instruction because there is this persistent misconception that science stands alone; that it does not have math, English, or any other subject in it, just the memorization of facts and strict procedures. If I support this awareness of the transferability of skills, methods, and knowledge to other domains, I not only increase the interest of my students in science, but also make students aware of the directions science can take them towards their future goals.

Since this study appears generalizable towards my future population, I plan to utilize their methods of pre- and post-assessment for measuring transfer and their question types to increase awareness of transfer and the spectrum across which it can be measured. I feel as if these question types work well for this population, but I would like to extend and diversify the approach to assess

along the transfer spectrum within my discipline through practice and additional research which has been alluded to in the following critiqued study.

**On inventing original solutions and assessing for transfer.** Schwartz and Martin's (2004) purpose in performing this research was to obtain more evidence for various approaches that enable students to create understanding. They explored this by focusing their analysis on whether activities that ask students to *invent original solutions to novel problems* would prepare students to learn from *direct instruction* better than direct instruction without inventing. These researchers also conducted a controlled assessment experiment on the last day to examine the possible advantages of looking for student's *preparedness for future learning through worked examples*. Schwartz and Martin followed a constructivist paradigm as they constructed their research with their impact on the research in mind (hence, experiment 2). Schwartz and Martin collected quantitative data around their subjects in the form of pre- and post-assessments with a delayed post-assessment taken by a randomized subset of their sample. As the researchers compared the two methods of teaching, they utilized a correlational approach.

Schwartz and Martin explored their question of whether having student invention prior to direct instruction would aid understanding over merely direct instruction through two almost identical experiments that took place over 2 weeks. The main difference between the two experiments was that, while the first experiment was performed by the researchers, the second experiment was performed by teachers who had varying levels of practice with the approach—to show both learnability on the part of teachers and the effectiveness of the practice without a dependence on who is teaching.

In the first experiment, from a school that did well on state test scores, but had little practice in invention learning, 6 classes of 9<sup>th</sup> grade algebra students participated at the end of the year in their own classrooms (95 students taking both pre- and post-tests), with 30 of these students being randomly selected to take a delayed post-test a year later. In experiment two, 4 teachers taught 7 algebra classes. One of the teachers taught 3 classes using lectures only, another teacher taught 2 classes and was more discussion oriented; both these teachers had seen the effects of the first experiment. The other two teachers (who each taught one class) had not seen the first experiment and one of these created lecture-based lessons while the other had a discussion-oriented classroom.

Although the researchers did not go into detail about how their samples were created, they did briefly describe them as all from one school. I posit that they have done a convenience sampling of the population at this school as there was so little detail around the subjects of their research.

In both experiments, there were two forms of assessment; one was given as a pre-test, and one was given as a post-test, however the research does not say whether the population was divided and half were given one form, the other the other form as pretest, and then switched, so the effectiveness due to the potential of the population becoming test-wise of the pre- and post-test is difficult to determine. The pre- and post-tests were created to measure student's procedural skills, qualitative understanding, symbolic insight (an exploration of why surrounding the variables in equations), adaptive knowledge base, and whether they can transfer their understandings to create new ones. Within the last part of the post-assessment, where students were to show their ability to transfer the information, was where the assessment part of the experiment lay. As students were about to take the post-test, they were divided into two groups randomly in order to compare the *standard transfer paradigm* to something Schwartz and Martin call the *double transfer paradigm*. Double transfer is where students are “*transferring in*” by making sense of new

information on top of old prior knowledge and then “*transferring out*” by taking these new understandings and applying them to new contexts. Double transfer is approached differently than standard transfer in that it involves a *common learning resource* (like direct instruction or a *worked example*) before a transfer problem is given. The delayed post-tests taken by 30 randomly selected students from the initial population assessed students’ understanding and memory of the mean deviation.

Schwartz and Martin found in experiment one, with a significance of  $p < 0.5$ , that 17% of the students passed the pre-test (all of which got a worked example aiding double transfer), while 91.7 % of the students passed the post-test (half of which got the worked example). Of the two groups who were taught using invention-based curriculum versus tell-and practice, half of these two groups received the worked example. Those from both the invention based and the tell-and-practice showed more significant gains in post-test means when they had the embedded worked example in their post-test over those who didn’t, also, the worked example had a much larger difference on post-test scores in the invention-based group. The researchers concluded that there was value in the double transfer paradigm in the assessment because it detected levels of understanding missed by the standard transfer paradigm, especially in methods that are supposed to increase transfer.

Around this question of how transfer could be assessed, this article provides some evidence for the practice of utilizing the double transfer paradigm in assessments. This article also confirms what Fuchs et al. (2002) and Moody et al. (1971) have noted as far as the importance of pre-, post-, and delayed post-tests as a measure of transfer. Schwartz and Martin also propose some general question types that could be applied to my classroom. It is also interesting to note the success of the invention based teaching method compared to the tell-and-practice method (especially when double transfer was taken into account) as far as methods that could be employed to teach for transfer.

Schwartz and Martin’s use of thick description aided significantly in understanding their approach, and; if it were not for the lack of description around their implementation of their pre-, post-, and delayed post-tests, I would have no questions surrounding this article’s internal validity. The generalizability of this study could be drawn into question as I consider the researchers’ lack of description in how they chose their sample and their sample’s composition of only students from a high performing school.

Due to Schwartz and Martin’s inclusion of the second experiment to remove the experimenter’s effect on results, with proper scaffolding, the use of worked examples within an assessment could be extremely useful towards measuring *immediate transfer*—both *near* and *far* in my classroom. In addition, these researchers utilized pre-, post-, and delayed post-tests that included questions that focused directly on skills, understanding, insight, adaptability, and transfer that I feel apply in science and will aid in my goal to make science accessible and useful to a wider array of students. In my next two research articles, I will explore alternate techniques that focus on the use of qualitative data in assessing for transfer.

**On the use of phenomenological assessment.** Hickman and Kiss (2010) designed a qualitative study to investigate students’ responses to *cross-curricular* methods in order to highlight the use of *cross-curricular links* (shared skills and strategies between disciplines). These researchers conducted two case studies that were performed with the phenomenological approach to discover how cross-curricular learning was interpreted by students. While the focus of this research was heavily based on student interpretations of cross-curricular study, it also acknowledged the prospective methods that might be utilized to assess whether *transfer* occurred.

Hickman and Kiss found 2 students from two 6<sup>th</sup> grade British classrooms from which they could analyze their results through a phenomenological approach. These researchers described that they had difficulty in finding teachers willing to participate in their study. Hickman and Kiss took advantage of a convenience case study sampling in order to carry out their study. They acknowledge that they were not attempting to generalize their findings, but instead, provide evidence of how cross-curricular strategies impact individual students, thus the small sample size and the phenomenological approach. The students were observed and thoughts analyzed during interviews, classes, museum observations, teacher questionnaires, and follow-up lessons. The observations that were made of the students and teachers were then member checked by the subjects of the study for correctness. As part of the phenomenological approach, all students were asked the same open-ended questions in interviews, followed by probes and follow up questions. Although there was mention of the need to analyze for *prior knowledge* of cross-curricular teaching styles, this study did not, unfortunately, go into detail about the data that they gathered surrounding prior knowledge, thus it is a difficult study to apply their outcomes as evidence to defend my practices. This study did, however, provide a large amount of information related to phenomenological studies – the benefits and drawbacks and how individual students were transferring understandings across subjects could be assessed using the drawn out phenomenological approach.

In conclusion, Hickman and Kiss found that students had difficulty reflecting on their learning experience involved in the study and pointed out that they could have used an additional step in their research that asked students to compare the effectiveness of cross-curricular teaching to non-cross-curricular teaching. They also commented that students said that the links between the two classes were more pronounced when the teachers made the links explicit and used questions to draw out and expand upon students' prior knowledge, but also, that students were generally unaware of the relevance of such links.

Hickman & Kiss, rather indirectly, pointed out that they should have taught students some *metacognitive* strategies prior to the study as they reflected that it was rather difficult to get students to reflect on their learning experiences. In order for this assessment strategy to work, students need to be aware of, and have extensive practice in using a variety of metacognitive techniques. The more metacognitive strategies students are made aware of, the easier and faster you can get student reflections on the learning strategy, thus this assessment method might become more useful as time goes on within a classroom.

This study, it could be argued, contained more critical analysis of their methods than actual findings. I trust their methods; however, with very little data provided, I was not sure that I could trust their results and conclusions. Presumably, the data was in a form that is difficult to access; however, I needed more detailed data and a *much* larger sample size in order to put any reliable emphasis on their findings.

As the written evidence of their findings was, basically, not available and the sample size was so small, these findings could potentially be a fluke. Although it was interesting that these researchers found that cross-curricular links must be made apparent in order for students to be aware of transfer. Even though more evidence and future studies need to be found around this method of assessment to make a definitive argument for the utilization of these methods, the use of interviews and observations could be a useful formative assessment for and of transfer. This method does take a long period of time; however, it could be especially useful for students with disabilities or for ELL

students who might not have the skills to write fluently about how they utilize information in different contexts, but might be able to describe verbally their thoughts around the understandings.

Cross-disciplinary studies focus on what I would call mid-level transfer-as it's not near transfer, where a problem is changed just slightly and students can utilize the same exact method with barely any alteration to solve it; and it's not far transfer, where students have learned something in school and are then expected to alter that information to aid them in real life. Cross-curricular transfer is somewhere in the middle, where two subjects within school are compared and show both similarities and differences in the methods and ideas learned. As there is such variability in the types of transfer that can be measured, the phenomenological approach and, I would argue, the metacognitive approach to measuring transfer are methods that are possibly best applied to assess mid-level and far transfer because what they are measuring is not what the teacher or the researcher is looking for, but where the student has connected the information—these approaches do not tell my students where they should be transferring their learning, but instead tell me where the student has taken the learning.

Since this study focused on the issue of student interpretations of cross-curricular methods and their effectiveness over how to assess whether cross-curricular methods foster transfer of skills, knowledge, and understandings, I need to look at other studies to get a more complete view of this necessary step that provides the underlying evidence for the teaching of transfer.

**On cognitive apprenticeship and transfer.** Lee (1995) hypothesized that the use and awareness of the student's *prior knowledge* of themes, values, and social conventions can be used to teach skills in literary interpretation to aid in the progression of the student from *novice* to *expert* using the *cognitive apprenticeship framework*. Cognitive apprenticeship is where teachers coach students in the methods and strategies they use to understand, make sense of, and transfer academic learning. This research also took a *situative* perspective, in that it emphasized the impact of culturally responsive teaching as it investigated the benefits of using ethnically diverse literature with ethnically diverse students (Collins, A., & Greeno, J., 2010). Lee designed her study to make use of both qualitative and quantitative measures as she kept track of both discourse in whole and small group work and measured student achievement through the use of pre- and post-assessments. This approach follows the transformative paradigm as it posits an argument for culturally sensitive instruction and, as necessitated by the research questions and paradigm, requires a homogenous sampling strategy around African American students.

Lee's study was based on 6 classes from 2 urban schools in the Midwest. All of the students in the study were African American high school seniors studying world literature. Of the 6 classes, 2 classes were the control group taught by local teachers, 2 of the classes followed the scripted instructional methods outlined and were taught by local teachers, and the last 2 classes followed the scripted instructional methods, but were taught by the researcher. Students were given both pre- and post-tests before and after the learning to measure quantitatively so that methods could be effectively compared. Students had to be taught along the way how to become more *metacognitive* as they looked at their prior knowledge and voiced the strategies used to understand the literature given to them. Over time, students gained both *general and task specific strategies* that enabled them to broaden their *schemas* around the interpretation of literary texts which then enabled them to *transfer* these strategies to multiple African American texts.

The author found that the experimental groups (all 4) achieved significant gains over the control group from pre- to post-test. Students were also beginning to think (in terms of interpreting fiction)

more like experts and were developing more interest for interpreting the language of literary texts. Students had begun to see the value in supporting their responses to complex problems with knowledge of the social world of the text, and students were beginning to take over the dialogue in the class with 76% of the talk in the classroom.

Although this study *does not make explicit reference to transfer* (thus, all references to transfer are of my own creation), Lee's reliance on the cognitive apprenticeship model was very closely related to the situative view of transfer where skills are transferred through thinking around the context of the learning and the individual's community of practice (Collins A., & Greeno, J., 2010; Engle, R., 2006). The cognitive apprenticeship model involves making higher thinking visible and explicit so that it can be replicated by a student. This means that both the teacher and the student are thinking metacognitively about the domain knowledge, heuristic strategies, control strategies, and learning strategies necessary to approach and interpret a text alongside learning centered on the conceptualization of the whole problem and its application to real-world contexts. This emphasis on an awareness of strategies that can be applied to multiple texts and, even to multiple contexts, constitutes both *near* and *far transfer*. The methods used could be useful towards teaching for transfer and that the assessment protocol could be applicable towards measuring transfer.

As a teacher in an urban school setting, it is necessary for me to consider alternate teaching strategies that emphasize different perspectives and cultural norms so that my diverse students can make authentic connections with the learning and transfer that learning within their cultural context and their real-life situations. Although I will not be an English teacher, as a science teacher, it is necessary for me to consider the bias in scientific literature towards dominant white culture and how this emphasis can produce negative transfer for my minority students. Since my students include high school students of African American background, I believe that I can transfer these findings around using the cognitive apprenticeship model to my classroom, but should be aware of the potential for spot-lighting as my students will likely not be a homogeneous population.

Lee acknowledged that there were multiple variables that must be considered between the control and experimental treatments that could influence the findings: (a) Small group work vs. lecture and recitation, (b) slow movement of the focus of control from teacher to students vs teacher dominated, (c) African American fiction vs. Euro-American and western European fiction, (d) prior knowledge of signifying and social knowledge vs not drawing on prior knowledge, and (e) emphasis on complex, inferential questions vs. focus on literal analysis and recall. The researcher also noted that some students did not feel as if signifying (a form of talk attributed to African American communities that involves ritual insult, or can be used to persuade, inform, or criticize, the major focus in these lessons) was a method of speaking that they utilized. However, this study also uses many research methods meant to decrease error, such as the thick description involved in the methods section, the peer debriefing when Lee utilized outside sources to grade the pre- and post-tests, the acknowledgment of the impact that a known teacher versus an outside researcher can have on a population, and the use of triangulation to qualify her results. As there are so many variables between the two study groups, it is difficult to confidently say that the cognitive apprenticeship model lead to students being able to transfer their learning to alternate contexts.

This study illuminates yet another approach to teaching for transfer which is useful to the group's general agenda of identifying and analyzing the effectiveness of different approaches. Although this study was not explicitly about transfer, as already noted, this study shares a great many similarities central towards teaching for transfer such as a focus on developing more

complex thinking skills, an emphasis on the need for being explicit in teaching strategies and the variety of applications they might have in alternate situations, the modelling approach an emphasis on *broadening schemas* to move my students towards becoming experts in the discipline, and creating connections between ideas that can be drawn upon in future, real-life situations.

I can therefore place some emphasis on the application of Lee's methods to assess whether her students benefitted from cognitive apprenticeship towards assessing for transfer. Lee assessed her students using multiple strategies – a pre- and post-assessment which showed numerical evidence for *student growth* (however, the kinds of questions involved in these tests were not divulged, thus it is difficult for me to replicate these kinds of questions in my own practice), and observed evidence taken from how students engaged with and provided evidence for ideas, how often students used learned strategies to interpret the literature, how much of the dialogue was student led, the general mood and motivation the students put forward all relative to the control group (however, only the experimental group's responses were detailed in the discussion, so it is difficult for the reader to gauge the difference between the groups). This combination of both qualitative and quantitative means of assessment for transfer-like qualities could be a valuable practice to put in place in my classroom.

**A summary of assessing for transfer.** This question of how to assess my students on how they transfer ideas, thoughts, and understandings to other contexts or other tasks has just begun. Although there is much room for additional sources and ideas to assess for transfer, I feel that I have found some legitimate assessment methods that I could employ in the near future that would provide insight to how my students are transferring their understandings. In my research, I found evidence for the use of pre- and post-assessments (Fuchs et al., 2002) and delayed post-assessments (Moody et al., 1971; Schwartz & Martin, 2004). Several studies advocated for a variety of problems to measure the spectrum of transferability that students could be at, depending on a plethora of individual traits (Bransford et al., 2000; Fuchs et al., 2004; Lohman, 1993). There were also studies which emphasized the importance of making students aware of the goals and the use of backwards design before teaching the unit in order to be sure that my efforts set students up to succeed in positive transfer (Butterfield & Nelson, 1989; McKeough et al., 1995; Wiggins & McTighe, 2005). There was some evidence towards having two versions of tests to use as pre- and post-tests and using them interchangeably even within the same time period (Fuchs et al., 2002). Schwartz and Martin (2004) also proposed the use of the double transfer paradigm which utilized worked examples in pre-, post-, and delayed post-tests. Subjective evidence of transfer was also gathered in the form of interviews, observations, strategy use, and motivation of the students that could be used in combination with more objective measures of transfer to provide a fuller description of my students and their fluid movement of understandings (Hickman & Kiss, 2010; Lee, 1995).

With these findings in mind, it is necessary to reaffirm that there were issues in the transferability or generalizability of the practices to my classroom in these articles. None of the articles I found were focused on science. Few were of high school students. In order to get more concrete data to back up my future practices, I need to seek studies that look at samples and contexts similar to my own. I also found it difficult to find an actual assessment of the researcher's assessment techniques. Schwartz and Martin (2004) were the only researchers to explicitly look at techniques to measure for transfer. For future research, I will make it my priority to find articles that focus on assessment strategies and I will experiment with the methods I have learned about to see how they

work in my context with my population, how these methods could be adapted, and where the research has holes that can be filled with additional research.

**Areas for future research.** From these articles, I have reaffirmed that transfer is difficult to measure. Transfer is inherently vague. Transfer is individualized as it is situated in contexts that are outside of my control (Lohman, 1993). There are methods that I can utilize to contain and assess transfer. However, these methods are far from perfect as I attempt to measure a greater diversity in population (Lee, 1995). There is further research to be done and further research to be found that might aid me in my attempt to hold transfer accountable.

My largest hurdle towards accurately measuring transfer lies in defining and making explicit exactly what links I am looking for and how far I want my students to transfer the material at hand (Fuchs et al., 2002; Hickman & Kiss, 2010; Lohman, 1993). Although I don't want to limit my students' observations around transfer, I do have to decide what students should be held accountable for. I could broaden this accountability (due to my students' individuality) by increasing the broadness of interpretation around a question; however, the broader I go and the closer I move towards phenomenological approaches, the more time consuming this assessment becomes (Hickman & Kiss, 2010). I advocate that these broader questions or interviews around questions be reserved for students who are struggling or have indicated on the pre-test that they might require some differentiation in this particular subject.

My next steps in my investigation are to research and apply differentiated and metacognitive assessment techniques. If I simplify a little, transfer can be thought of as occurring on a scale and so can differentiation. This scale is not stagnant, like a measurement of ability, but changes with the subject at hand and the individual's experience and relationship with it. I therefore think that there is reason to suspect that a key to assessing for transfer might involve differentiation. I also think that metacognitive assessment could be an invaluable insight and tool for my students as they begin to assess how they are thinking about the subject at hand and their opinion of the relationships to other subjects and this change in complexity over time.

### **Summary on Transfer**

The purpose of our research is to discover how we can create a focus on transfer in our public school classrooms to support student understanding and to broaden these understandings so that connections to individual experience and future lives can be made. We were given a hint at the importance of teaching for transfer in our first year of our Master in Teaching program which our group felt we should develop into something practical. We understood that transfer had an important role to play in terms of closing the gap between academic knowledge and students' real life experiences. With this paper, we have begun our search to find the optimal conditions that support transfer. We must acknowledge, however, that we have barely scratched the surface and must continue our research on transfer. We have room to grow with regards to our understandings around our individual questions on the brain, ELL students, metacognition and assessment, as well as other questions that aid us in the application of transfer.

One of the goals of this paper was to discover what conditions support transfer at the cognitive level. All our students have something in common, a brain. Although some brains work in quite different ways, they generally follow a biological pattern. What affects transfer in the brain

gives us a launching point to then go into more depth for each individual. In this part of the paper, it was found that emotional and physical experience around prior understandings has an effect on future applications (Nemirovsky, 2011; Zull, 2002). Time is also a necessary component for the individual to transfer and cannot be rushed or artificially created (Chen, 1999; Jelma & Pieters, 1989; Nemirovsky, 2011). A variety in tools and resources as well as a variety in transfer tasks has also been noted as conducive to transfer at the cognitive level (Chen, 1999; Nemirovsky, 2011). Explicit attention to patterns in the material can be useful in identifying and broadening schemas in the individual, evidence suggests this to be true for school age learners and with adult learners as well (Chen, 1999; Jelsma & Pieters, 1989; Van Merriënboer et al., 2002). Our research has brought up questions for further investigation, to find out the most effective methods to increase the way students transfer.

In this next piece of the transfer research we wanted to apply the concept of transfer to a specific population which could benefit greatly from transferring learning across contexts; ELLs. Additionally, the author of this portion of the research thought it was worth to incorporate the insights of her two endorsements, Spanish and ELL, to investigate how transfer would look for Spanish-Speaking ELLs. The main reasoning behind choosing ELLs is the thought of helping a segment of the students' population that faces a double challenge at school, learning a second language while trying to learn content in the language they are trying to acquire. The ELL classroom portrayed in this section needs to find ways to support transfer, so the language development process these students undergo to learn literacy skills in this classroom, find ways to be applied to other contexts in the school. In this segment of transfer research four quantitative studies (Jiang, 2004; Irujo, 1986; Saegert, Kazarian, & Young, 1973) and one qualitative study (James, 2012) were reviewed. The revisit of all five studies brought to light that the use of the students' first language is actually one of the best ways to support the academic language development, which in turn has the potential to enhance second language acquisition (Jiang 2004; Irujo 1986; Saegert, Kazarian, & Young, 1973). Thus, a great deal of support appeared towards bilingual education to benefit second language acquisition and promote transfer. Additionally, metacognition appeared as one crucial element for transfer to occur (James, 2012; Bransford et al., 2000; Engle, 2006). These findings assist us in our inquiry to serve our students better by infusing thinking routines in them that can be applied to different contexts (Ritchhart, Church, & Morrison, 2011). This becomes a way to make transfer visible and encourage our quest of finding the optimal conditions to teaching for transfer.

The intention within this section of the research was to find relevant and effective ways to integrate student metacognition into a public school classroom that is interested and dedicated to supporting transfer. Research that informed this investigation described student metacognition itself as a meaningful tool because it gives students the ability to name and define what they know and do not know with regards to what they will be able to apply to a transfer situation (Bransford, 2000). Transfer occurs or it does not, and the insights into this suggest that teachers can take on specific roles that teach to student metacognition, and as a result support the eventual positive transfer. (Leat & Lin, 2003; Scardamalia et al., 1984; Butterfield & Nelson, 1991). With this in mind, it is important to consider that various situations will be barriers to transfer, including what students think they know or recall (Karpicke, 2012; Hart & Albarracín, 2009). The overall implications for how this research speaks to our investigation of transfer attends to our students' abilities to engage in critical thinking that give them control in the education experience, as well as support *preparation for future learning* (Bransford & Schwartz, 1999). Student metacognition can support transfer that happens in the

classroom and make connections to the transfer that happens once students leave it. The findings in the research offer ways to inform design and implementation of metacognitive strategies that support transfer in such ways that teachers will in tandem to this, be providing powerful thinking and meaningful self-monitoring moves that can themselves transfer from year to year.

In our last portion of this research we wanted to find viable methods of assessing our students around transfer. In this section, it was found that the use of both quantitative and qualitative assessments can be useful to obtain an understanding of our students' movement of ideas and connections around understanding as well as the potential for future transfer to, as yet, unknown contexts and tasks. The main quantitative methods emphasized in the research were the use of pre-, post-, and delayed post-tests (Moody et al., 1971; Schwartz & Martin, 2004), to have multiple versions of the tests to remove error around students becoming test-wise (Fuchs et al., 2002), and to provide worked examples within the tests to assess for immediate near and far transfer (Schwartz & Martin, 2004). The qualitative methods enumerated in the research involved interviews, observations, strategy use, and perceived student motivation (Hickman & Kiss, 2010; Lee, 1995). Many sources also noted the necessity of having a range of transfer problems within each assessment to obtain an idea of how well students are transferring at different distances (Bransford et al., 2000; Chen, 1999; Fuchs et al., 2004). These findings aid us in our initiation into the research to teach for transfer in that they show us where students might be in need of differentiation techniques, how well our methods of teaching for transfer are working, and the variety in approaches to assessment that allow us multiple perspectives to look at how our individual, diverse students are thinking about the learning.

From this review of the literature, we have collectively come to realize that transfer is both positively and negatively affected by a great number of aspects that, if the effort is made, teachers can command some control around transfer. Although transfer is affected by both the student's physical and emotional conceptions around pieces of knowledge as old and new are combined and cannot be induced automatically, we understand that patience and a variety of interactions that teach explicitly for and about transfer, with problem solving interactions along the transfer scale from near to far aid us in our attempt to get our students to transfer their prior understandings to create new understandings and then be able to apply those new understandings in alternate contexts (Jelma & Pieters, 1989; Karpicke, 2012; Leat & Lin, 2003). It was also noted that group work, differentiated learning tasks, and an attention to patterns through metacognitive practices and direct instruction make a direct impact on the student's ability to transfer understandings (Bransford et al., 2000; Chen, 1999; Lee, 1995). Since our students are individuals with different prior understandings and different backgrounds, much evidence has been shown to demonstrate that giving students control in the assignments and over methods used to understand through the use of metacognitive exercises aids our students along the entire transfer spectrum (Butterfield & Nelson, 1991; Scardamalia et al., 1984; van Merriënboer et al., 2002). If our students are English language learners, there is also evidence to support instruction in the student's primary language (Jiang 2004; Irujo, 1986; Saegert, Kazarian, & Young 1973). To assess our students for transfer, we should include pre-, post-, and delayed post-tests with a variety of transfer problems and worked examples with multiple versions of the test (Chen, 1999; Fuchs et al., 2002; Schwartz & Martin, 2004). Inclusion of qualitative data to measure students who are having more difficulty with making connections to the learning can also be useful to create a better understanding for both the student and teacher of how fluid and how well they can transfer their understandings (Hickman & Kiss, 2010; Lee, 1995).

As educators heading into our first year of teaching, we are gathering our ideas and preparing for how to effectively incorporate our new understandings into our developing pedagogies and instruction. Current plans include developing specific strategies that attend to effective, deliberate and well thought out methods that represent our best intentions with transfer. How we want to best structure and support transfer and assessment in our classrooms through a variety of strategies that were reported effective in all of our research reviews is at the forefront; however, in reality we are dealing with a different population. We will have to make informed decisions based on our students, but the new ideas and prospects are exciting and interesting. This includes making effective connections in the relevant areas of the brain through the design of the learning and students making their own meaning. In this and other situations it is important to attend to prior knowledge and engage prior learning. With ELLs it is essential to incorporate and speak to the students' dominant language where the source of their schemas and prior learning can be found. Additionally, metacognitive strategies need to be incorporated to allow both students and teachers to identify what learners know, how to modify instruction to attend to the way the brain learns, identify how prepared students are for a transfer task or future learning regardless of language spoken, and inform the design of various kinds of effective assessment. Providing students with the ability to self-monitor and have agency in their learning and transfer experiences happens within various kinds of assessments as well. Designing assessments that are intentional in their design will support meaningful and relevant transfer.

As we worked on this project, we learned a great deal of information from each other about transfer. For example, as we read articles that some of us had little prior knowledge in, we found it difficult to transfer that knowledge into something that we could use in our practices. We therefore gained first-hand experience that will cement into our minds the absolute necessity of creating an in depth pre-test and utilization of metacognitive strategies to self-assess prior knowledge and its relatedness to the subject; as we now understand that transfer cannot be forced and cannot be expected if gaps in prior knowledge exist or, if negative experiences with similar information or strategies have occurred. As we each completed our portions of our project, we also learned that, although our questions initially seemed quite different from each other, we found similar ideas and evidence in each other's research that provided additional evidence towards the practices we found important in our sub-sections.

Although our journey has not yet ended, we feel that teaching for transfer in each of our disciplines is absolutely necessary for our students to see the use in becoming a life-long learner and to learn the practicality and future applications of the skills they are acquiring.

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# Instructional Planning Around Assessment and Feedback, and their Relation to Self-Regulated Learning

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*Matthew Frasier, Sarah Gese, Kat Vanek*

It is the role of the teacher to build classroom supports for student learning. This paper discusses a variety of points related to instructional planning and how those points support student development towards becoming self-regulated learners. This thematic review presents studies and articles on the role of assessment design, learning environment, the structure of feedback cycles, and self-efficacy and their impact on the development and use of self-regulated learning strategies. In the first section of this paper we preview some of the structures that can have an impact on self-regulated learning, in the second section we take a closer look at feedback and assessment criteria, while in the third we look more closely at ways that self-efficacy impacts self-regulated learning (*SRL*). The studies and articles for this review were collected using ERIC, Ebscohost, and JSTOR from peer-reviewed journals to help gain better insights into what self-regulated learning is and ways to develop and support it with our students. The key insights that arose within each section that attended to students becoming self-regulated learners: (1) classroom culture and assessments should be student centered in ways that promote a recursive learning cycle that utilizes *SRL* strategies, (2) developing the metacognitive skills tied to self-assessment is key to being able to understand criteria and apply feedback, (3) increased self-efficacy supports greater use of self-regulating strategies.

**Keywords:** *Self-Regulated Learning, SRL, Assessment, Formative Assessment, Feedback, Self-efficacy, Adolescent SRL, Self-Assessment, Task Criteria*

This paper is designed to look at various aspects of instructional planning and assessment to better understand the ideas and processes of formative assessment and how it aids students' self-regulated learning. This includes but is not limited to assessment criteria, feedback, goal setting, motivation, self-reflection, and self-efficacy beliefs. The focus is directed by our question: what are effective planning strategies to improve assessments and feedback with the goal of best supporting student learning?

Assessment and learning are intertwined (Wiggins, 1998). The shift towards formative assessment as a more commonly used practice arose from the increasing general acceptance of a more holistic lens of education that is rooted in socio-cultural and socio-cognitive theories (Clark, 2012). Wiggins also addressed the importance of changing how we view assessments in order to improve student learning. Through the thoughtful implementation of formative assessment, teachers have the ability to

guide students in building the skills that will enable them to proactively and independently address their own learning needs in the present moment. As they engage in this metacognitive process, students are developing the skills to guide future learning as well.

Educative assessment is an ongoing process which leads learners to develop the ability to self-assess and adjust their work. The theory of formative assessment is found to be a unifying theory of instruction, which guides practice and improves the learning process by developing *SRL* strategies among learners. In a postmodern era characterized by rapid technical and scientific advance and obsolescence, there is a growing emphasis on the acquisition of learning strategies which people may rely on across the entire span of their life. Research consistently finds that the self-regulation of cognitive and affective states supports the drive for lifelong learning by: enhancing the motivational disposition to learn, enriching reasoning, refining metacognitive skills, and improving performance outcomes (Clark, 2012).

Assessment can be designed to enhance motivational and self-regulated cycles of learning by integrating essential features of problem solving, self-regulation processes and dynamic feedback to help students set goals, monitor progress, evaluate their performance, and make adjustments to improve their performance. These models are primarily based on the development of self-regulatory process but also on its underlying message of establishing hope and empowerment in students, their parents, and/or teachers (Cleary & Zimmerman, 2004).

**Framework and implications for the teaching community.** From Ian Clark's (2012) literature review we frame formative assessment as any assessment that is "intended ultimately for student reflection who use it as 'take-home' information for self-management and control" (p. 215). We take Self-Directed Learning (*SDL*) to be "any increase in knowledge, skill, accomplishment, or personal development that an individual selects and brings about by his or her own efforts using any methods in any circumstances at any time" (Gibbons, 2002, p. 2). We take Self-Regulated Learning (*SRL*) as more of an umbrella term for such processes as goal setting, metacognition, and self-assessment (Loyens, Magda, & Rikers, 2008).

This framework is how we connect our teaching practices to the ideas of formative assessment, *SRL*, *SDL*, feedback, and educative assessments. These connections also allow for others within the teaching community to focus and refine their practice around the same ideas.

Teachers need to support students in self-assessing what they know and what they need help with in order to become self-regulated learners. Self-efficacy beliefs can be altered if specific self-regulating strategies are implemented within content areas and designed tasks. Self-reflection after completing a task can strengthen self-regulation skills and self-efficacy beliefs (Ramdass & Zimmerman, 2008). Teachers are an essential component to establishing a learner-centered classroom. It is important for students to be able to self-assess where they are at in relation to the specific learning target or task in order to promote self-regulating strategies, including goal setting and becoming aware of extra support needed. "Classroom practice must not only cultivate the knowledge to succeed, but should nurture the belief that one can succeed" (Ramdass & Zimmerman, 2008).

Teachers must plan carefully but be flexible in order to create an optimal environment for supporting self-directed learning (Marshall, 2010). "An educative assessment system is designed to teach – to improve performance for both student and teacher. . . it is built on a bedrock of meaningful performance tasks that are credible and realistic (*authentic*), hence engaging to students" (Wiggins, p. 12). Understanding key components of lessons that allow students to build skills and practice them are crucial to this goal. Brookhart, Andolina, Zusa and Furman mentioned that assessment design that is inclusionary of student involvement in the assessment of their work "can add reflection and metacognition (thinking

about thinking)” to specific memory lessons in math (Brookhart et al., 2004). “As with all learning strategies, student self-assessment needs to be taught, coached, and supported” (Brookhart et al., 2004). Utilizing criteria is an important component to effective formative assessment and feedback.

When designing criteria, there should be a close connection between the specific intended outcomes, often centered on rubric criterion. From there, the work should focus on developing the skills related to those outcomes. When this is done, research shows that the resulting deeper learning enables students to close the gap between their initial ability and their desired outcome, the progression of student feedback is more closely linked to the assessment and skill development, and the feedback regarding the coursework is put into a wider dimension of the students overall progression (Randall & Zundel, 2012).

Brookhart (2008) described two major kinds of feedback: External, from the teacher and internal, from student self-evaluation (p. 3). She also connected their effect on student’s knowledge and beliefs to other research. Clark (2012) also discussed feedback in terms of synchronous and formative feedback. Where synchronous feedback is the in the moment or appropriately timed feedback and formative feedback is where a student’s cognition is adjusted and allowed to directly refine their work. These ideas are also echoed by Wiggins (1998) in examples of educative assessment and by Randall and Zundel (2012) with their research on the use of multi-channel feedback. Gibbs and Simpson also described conditions in which assessment supports student learning: the use of clear criteria related to the purpose of the assignment, coupled with prompt detailed feedback utilizing these criteria, and opportunities for students to use it in subsequent assignments, as key conditions for effective feedback (as cited in Randall & Zundel, 2012). Further information on feedback and its connection to criteria will be discussed further in the second section of the paper, “*The Use of Criteria and Feedback in Educative Assessments.*”

**Issues and points of disagreement.** A main point of disagreement about formative assessment has to do with how it is defined and what it looks like, which may differ greatly by educational context and content area. Clark notes a general consideration of formative assessment as a “fuzzy” area in education (Clark 2012). Some argue that a teacher’s belief system and teacher self-efficacy are key issues that underlie the ability to use formative assessment effectively (Marshall, 2012). The use of formative assessment places teachers in a guiding or coaching role which fits with a transformative view of education, but may seem controversial to those that are accustomed to more traditional approaches to instruction and assessment (Wiggins, 1998). Some issues of note regarding formative assessment are mainly issues of implementation. Formative assessment is a complex, multi-faceted, and ongoing process that necessitates teacher training and support to implement and use well. For this reason it can be challenging for educators to be clear with their purpose, audience, standards and criteria for assessments that have larger objectives. Formative assessment has many aspects that may need to be scaffolded for students including self-assessment, goal setting and reflection. In order to use formative assessments effectively, teachers must plan well, including leaving room for ongoing adjustment of activities and instruction based on student’s demonstrated understanding (Wiggins, 1998). Because of this complexity, time is a key factor – it takes a considerable amount of time and reflection on the part of teachers to plan for and effectively use formative assessment. As teachers new to the field we have had the experience building assessments utilizing backward design and know how time consuming it can be. It is also noted by Clark (2012) that giving effective feedback can be a formidable task.

**Limitations of our research.** Throughout our research process our questions were guided by the resources we could find. The studies were gathered in December of 2013 using Ebscohost and ERIC databases as well as the library book database at The Evergreen State College. Initially, the search terms including *self-regulated learning, SRL, self-directed learning, assessment, formative assessment,*

*criteria, education, self-efficacy*, were combined in various ways along with a focus on particular authors such as Zimmerman, Bandura, Orsmond, William and Black who appeared regularly through our searches. We also used various content related search terms and made sure that our selected studies and articles were all peer-reviewed. A literature review, trade book, and encyclopedia article were used to ground the paper in current understanding of formative assessment practices in the field. Original qualitative and quantitative studies were used to further explore our individual research questions. Given the time constraint of this project, we were limited in the number of studies we were able to investigate in detail. The studies we were able to find may not give a complete picture but do start to show where the focus of research has been. Some of the studies we found state particular research that needs to be done or that was in the planning process at the time of publication for those studies. Additionally, many studies that we found were based on adult learners in a college setting – not directly applicable to any of our educational settings. Our initial decisions about studies to include had to do with the alignment of the researchers' question to our question as we did not yet have the developed skills and experience to discern the strengths and limitations of the studies.

**Different group member's focus.** The first section of this paper, "*An Overview of Various Planning Strategies Relating to Self-Directed Learning and Self-Regulated Learning*" discusses a variety of articles that paint a broader picture of *SDL* and *SRL*. The author looks into the strategies, tied to assessment and feedback that teachers should use to foster *Self-Regulated Learning* and *Self-Directed Learning*. This will also be tied to the overarching question of this investigation: what are effective planning strategies to improve assessments with the goal of supporting students to become self-regulated learners? Some of the topics discussed in this section will include: how a course's structure can impact a student's readiness for *SRL*, how student differences affect self-efficacy and *SRL* strategy use, the impact of teacher's theory of personal assessment on their potential to develop *SRL* strategies in their classroom, how to address issues with giving feedback and allowing for students to use it, and how assessors might impact the scores they are giving on a rubric based assessment.

The second section of this paper, "*The Use of Criteria and Feedback in Educative Assessments*", will examine the relationship between criteria and feedback in formative assessment that benefit student's conceptual understanding of content and future performance and ability to track their progress on a continuum of understanding a learning target or developing a skill. Some of the topics discussed include: the use of exemplars to inform comprehension of criteria, the use of self-assessment and peer assessment to aid the learning process, the impact of self-evaluation on performance, the alignment of feedback to serve its' intended purpose, practices that fit a framework for sustainable feedback, the use of rubrics for establishing and understanding task criteria, as concrete reference material for self-assessment, and as a tool for providing feedback. The research examined shows clear connections between these practices and enabling self-directed learning.

The last section of the paper, "*Self-regulated Learning Development and its Effect on Self-efficacy and Conceptual Understanding in Science*", discusses the different ways that students can become self-regulated learners and how that affects conceptual understanding in science and self-efficacy beliefs. Also discussed and informed by the research is the potential connection between formative assessment, beneficial self-regulated learning strategies, and valuing a classroom culture that promotes self-regulated learning and self-efficacy beliefs in science education with regards to middle and high school students.

## **An Overview of Various Planning Strategies Relating to Self-Directed Learning and Self-Regulated Learning**

*by Matthew Frasier*

In this segment of the paper I investigated the kinds of planning and teaching strategies teachers engage in and how they relate to *Self-Regulated Learning (SRL)* and *Self-Directed Learning (SDL)* and ways those strategies support student learning. These ideas were explored from the perspective of a pre-service teacher preparing to enter high school mathematics with a strong foundation in constructivist learning theory.

During my fall student teaching placement I noticed some disconnect between me, my students, and the assessments and feedback I was using. This disconnect made me wonder if my assessments and feedback were allowing for self-regulation since that was an intended, if not clearly communicated, goal. Due to the lack of communication around this, there were also some related classroom management issues relating to self-regulation, engagement, and class structure that arose. These issues helped me to focus my research on a variety of articles and studies that demonstrate what it means to have a classroom that fosters *SRL*.

In order to investigate this, I centered my investigation on the following question: what strategies, tied to assessment and feedback, should teachers use to foster *Self-Regulated Learning* and *Self-Directed Learning*?

The studies and articles gathered to compile this paper have helped me identify some ways to help refine my teaching practice as I prepare to enter the classroom. Some results I have found insightful include how a courses' structure can impact a student's readiness for *SRL* (Dyanan, Cate & Rhee, 2008); how student differences affect self-efficacy and *SRL* strategy use (Zimmerman & Martinez-Pons, 1990); how a teacher's theory of personal assessment affects the potential to develop *SRL* strategies in their classroom (Davis & Neitzel 2011); how to address issues with giving feedback and allowing for students to use it (Sendziuk, 2010); and how assessors might impact the scores they are giving on a rubric-based assessment (Pomplun, Capps & Sundbye, 1998). The research also revealed several specific ways that the use of *SRL* strategies can help students. One in particular showed a positive relationship between the use of *SRL* strategies and improved scores for state and other externally-mandated assessments (Wiliam, Lee, Harrison & Black, 2004). The use of *SRL* strategies also seems to have direct implications related to scaffolding and utilizing differentiated instruction based on student readiness and familiarity with *SRL* strategies (Dyanan, Cate & Rhee, 2008; Zimmerman & Martinez-Pons, 1990).

My process for finding the articles and studies in this section was centered on a series of Ebscohost searches using terms such as: *assessment, criteria, feedback, self-regulated learning, SRL, self-directed learning, and SDL*. I also made sure that the resources found were peer-reviewed and attempted to find a wide range of studies with different methodologies and foci to help me understand the broad concepts of *SRL* and *SDL*. I further refined my search to locate articles or studies by specific authors, such as Zimmerman and Bandura, since they appeared in many of the search results connected to the areas of *SRL* and *SDL*. This selection of studies may not provide a complete picture of what *SRL*, *SDL* and what related strategies for implementation are, but they do allow for an overarching view and demonstrate some possible areas for further research.

**Class structure and self-directed learning readiness.** Dyanan, Cate and Rhee (2008) used a pretest-posttest experimental study to measure the impact of a course's structure on student readiness for *SDL* and its related skills. The experiment was structured to take place during four spring sections and

four fall sections of a college business program in 2006. It used a pre-test/posttest model to test the hypotheses:

H1: A structured environment will improve students' preparedness for SDL to a greater extent than does an unstructured environment.

H2: Students' scores on the SDLRS will show greater improvement when the learning structure matches the students' initial scores. By matching we mean that the higher scorers will improve more in an unstructured environment and the converse.

(Dyanan, Cate & Rhee, 2008, p. 98)

In the fall segment the course was left unstructured, with the assignments based on open questions from an unpublished syllabus. Students were allowed to define their research project based on a choice between five studies, intentionally allowing students to have greater opportunity to shape their work. In the spring the assignment given had highly focused details and explicit instructions. The results were considered based on a difference in mean and a multiple regression model using the pre and posttest scores on readiness. Dyanan, Cate and Rhee also discounted outliers if student's response change was greater than one standard deviation (26 points). This was done in an effort to reduce response bias. In the spring there were 8 outliers and in the fall there were 14 outliers. Overall, the useable results from spring were 66% and from fall were 76%. These results showed that 59% of students in spring were not ready for *SDL* and 61% were not ready in the fall based on the *SDL Readiness Scale*, developed by Guglielmino (as cited in Dyanan, Cate & Rhee, 2008, p. 98). These outcomes suggest that the highly structured approach was related to allowing for greater growth in *SDL* skills for more of the students. This also indicates that the development of *SDL* skills needs to begin sooner than the 300 level of college courses.

This study's sample included primarily seniors in college. Given what the study was trying to measure, I can see this as being at least partly generalizable to students of various ages and grade levels. Since the sample was done over multiple sections of a college program I can also see a possible wide demographic being involved although that information is not stated within the study, which could lead one to conclude that this was a homogenous group of individuals either by gender, race or other possible stratifications. There is a clear trend in their data that makes me think that matching structure to *SDL* readiness has an impact on learning, and that *SDL* readiness does need to be of higher importance in the earlier grades.

This implies that the framework for introducing *SDL* should start out as highly structured and teacher-driven and move toward open ended and student-centered in order to maintain the match between the developing readiness and *SDL*. This is nicely paralleled in *The Self-Directed Learning Handbook* (Gibbons, 2002), which suggests the same progression and even provides a model of a possible grade level progression for teaching the skills. Starting in 8th grade with the introduction of *SDL* activities and moving to independent thinking in 9th grade, moving to self-managed and self-planned learning in grades 10 and 11 and finally with *self-directed learning* in 12th grade (Gibbons, 2002, p. 29). This progression does not take into account some of the prior knowledge of *SRL* strategies that students may already be familiar with or have been developing in prior years of education.

Zimmerman and Martinez-Pons (1990) looked into the correlations between students' gender, ethnicity and giftedness and how that affected self-efficacy and *SRL* strategy use. Their study shows that even some younger learners are already developing some *SRL* strategies and, that as grade level increases, the self-efficacy of students and their strategy use increases.

**How student differences affect self-efficacy and self-regulated learning strategy use.**

Zimmerman and Martinez-Pons (1990) used a correlational study to look at how the differences among students (gender, ethnicity, and giftedness) affected students' self-efficacy and use of *SRL* strategies. They included four schools in this study. One school was highly selective towards gifted students scoring at, or above, the 99th percentile on a standardized test of mental ability. The remaining three were considered non-selective regular schools. The participants included an equal number of boys and girls and 30 students from each of grades 5, 8, and 11 from each of the schools involved. Their measures were focused around verbal and mathematical self-efficacy and the connection it had to *SRL* strategy use. In order to ensure their scales would discriminate based on grade level and that the test-retest method would work, they performed the test on a sample outside the sample population of the study. "[This] sample represented a broad range of academic achievement; it included students who were at academic risk as well as high achievers" (Zimmerman & Martinez-Pons, 1990, p. 53). The information was gathered using structured interviews that utilized predetermined questioning. This was then coded using a *strategy frequency* scoring procedure for measuring the strategies used. The tests to measure self-efficacy were given in order; first verbal efficacy then mathematical efficacy. The researchers used the *Student Academic Efficacy Scales* as their tool for measurement (Zimmerman & Martinez-Pons, 1990, p. 53). Here the researchers looked at the student's perception of their own academic efficacy. Their results showed that the verbal efficacy increased with grade for all students. They could not get any significant findings for mathematics efficacy as compared across grade level.

In the study girls reported doing more planning, setting more goals, keeping better records and self-monitoring as compared to boys. These results improved with age for both boys and girls. Gifted students were seen to have increased their use of the organizational and transformational techniques laid out in Baird as well as Corno & Mandinach (as cited in Zimmerman & Martinez-Pons, 1990). Gifted students also noted themselves as seeking more aid when needed from other students or adults. The correlational results showed trends for specific groups of students; girls or gifted students reported higher self-efficacy and the use of more strategies related to self-regulated learning.

This study included a wide range of possible samplings from a variety of schools. They mention the range of demographics that participated in the study but were clear to mention that they did not take specific measures on the demographics of their sample because of restrictions within the school policy. In their description of the sample, they mention that the majority of participants were middle class. Since there are a range of socioeconomic statuses (SES's) in most schools, I am curious whether these results are generalizable to groups outside of the SES range of this study, since I am interested in strategies that would aid a variety of learners including students with lower SES. It is important to consider whether or not SES had an effect on the access to materials or kinds of skills the student would be using with respect to this study. This, in turn, may have changed the results of the study by showing students of the lower SES's to have a different set of skills. Due to this issue the study is not fully generalizable to classrooms that have higher populations of students with lower SES. This is a partial homogeneity issue since the 'majority' of middle class does not account for the variability within the middle class range of SES. The study is very explicit in stating that it was not designed to address any kind of causal link which helps abate any issues with the post hoc fallacy.

The equal measures for gender and varied ethnic background were mentioned but no specifics were given to describe these demographics. The wide range of the sample and multi grade level implications do show trends that highlighted how some of the differences between students can affect

their use of SRL strategies namely: reviewing notes, seeking peer or adult/teacher assistance, keeping records, self-monitoring, goal setting, planning and organization.

These correlations show that students need to be given opportunities to develop a full range of *SRL* strategies. This also implies that some students may also have some prior knowledge and facility with some *SRL* strategies which is always a benefit when teaching. Since this study measured strategy use and self-efficacy and not learning outcomes, I will have to find other research connections that link *SRL* strategies to learning outcomes. One possible connection might come from the extent that teacher's choices for assessment strategies allow for self-regulated learning.

**Impact of teacher assessment practices on self-regulated learning development.** Davis and Neitzel (2011) used a case study to look into the relationship between teacher assessment practices and the development of self-regulated learning. The questions they focused on include: what do teachers' personal theories of assessment reveal about the role of *SRL* in their classrooms and to what extent do teachers' assessment practices have the potential to promote self-regulation? They used a series of observations and semi-structured interviews in two different schools in grades ranging from 4<sup>th</sup>-7<sup>th</sup>. The two schools included in this study were very different demographically. One was urban, the other rural, one with a high population of African American students, the other with a mostly white student body, one with over 80% free and reduced lunch, the other with only 48% free and reduced lunch. The use of thick descriptions of the demographics, their observational and interview methods, the use of scripted questions and peer debriefing all lend credence to the credibility and dependability of this study. The sample size for participating teachers was limited to 15 teachers with experience ranging from two to twenty years. The sample of teachers is somewhat small when considering the type of study, but the researchers do include information suggesting that between 100 and 300 observational samples per teacher per year of the study were used. This suggests that those observations as well as the interviews allow for an invaluable data pool which they used to triangulate their results.

This high number of samples and variety of information used reinforces the reliability and transferability of this study. Their results included noticing that teachers were the primary controlling factor for the assessments used in their classes. Specifically, teachers are the ones giving privilege to some learning goals over others and they tended to prefer artifactual assessments (*ones which collect physical/written artifacts*) due in part to the multiple competing audiences (*students, teachers, district, family members*) that view the assessments.

This study helps me to consider how my current understanding of the theories of assessment and my assessment practices will promote self-regulation. Since their results seem to indicate that teachers do not have their assessments prioritized for the development of *SRL*, I will need to take extra care in my assessment designs to make sure that I do have it as a priority. I will need to consider the overall structure of the environment and assessment to account for various *SRL* strategies and their development (Wiggins, 1998; Gibbons, 2002; Zimmerman & Martinez-Pons, 1990; Dynan, Cate & Rhee, 2008). In order to do this I will need to make sure that students have some control over the learning goals and how they will reach those goals, while still keeping in mind the content standards and what kind of evidence can be collected and distributed to the various audiences the assessment may have. The authors noted a need for further research on student-level data in addition to the gathered teacher-level data to allow for insights into the relationship between assessment audience and purposes.

**Learning oriented assessments.** Sendziuk (2010) looked at how a *learning oriented assessment task* can help address issues with how teachers give feedback to their students. This study took into account one of the possible relationships between the purpose and audience of an assessment. This quasi-

experiment/survey action research helped the researcher to enhance his ability to give feedback to students in ways that allow them to refine their work in meaningful ways.

Sendziuk (2010) used one of his cohorts of 2<sup>nd</sup> and 3<sup>rd</sup> year college history students as his subjects. He used surveys, a learning oriented assessment task, and student self-reflections as his sources of information. The learning oriented assessment in this case was writing a research paper and reflecting on the feedback given to them in order to come up with a short justification for their self-assessed grade. The surveys were non-compulsory and there was no discussion of any of the sample's demographic breakdown. The quasi-experiment used surveys as a descriptor of what students had learned and their experience through the process. The experiment itself was structured along the lines of a one shot case study with the treatment being the withholding of a grade until the self-assessment and justification were written. The final observation in this case was how much agreement there was between student and tutor evaluations. The process for the assessment and the ways in which the teacher, students, and tutors interacted during the experiment was not completely clear. The author did state that the tutors were giving the feedback and their grade was compared to the student's grade, but little mention was given to what other ways the students, tutors and teacher were interacting during the process or what their level of awareness was with regard to the research.

These seem to raise some possible validity issues. The lack of sufficient history beyond the survey; the possible issues with instrumentation difference between tutors, the survey and grade comparison; and the sample of a single cohort with no demographic data are all issues for internal validity. There are also some other issues centered around the choice of research topic, namely, if choosing their own research topic held an intrinsic value for looking at the feedback, and the surveys since they can be considered to have given students advanced information about using feedback during the experiment to those who actually took the survey. These issues make it difficult to generalize the author's results.

That being said this paper does show a process that is reiterated in *Educative Assessment* (Wiggins, 1998) and *How to give effective feedback to your students* (Brookhart, 2008). Giving detailed feedback on the strengths and weaknesses of the work and allowing students to use that feedback to inform a revision is a key component educative assessments or as the author Sendziuk (2010) calls it a "learning oriented assessment task" (p. 321). The results are also reinforced by other research that shows gains when students use rubric referenced self-assessment to revise their work (Brookhart et al., 2004)

The study by Sendziuk (2010) is also an example of a teacher developing their practice using an action research setting. This shows me a possible method for implementing a learning-oriented assessment. This kind of implementation also gets students to start thinking and engaging in self-regulatory processes, such as having them reflect on feedback for self-assessment as well as revision purposes (Randall & Zundel, 2012; Brookhart, 2008; Wiggins, 1998). This study also made it clear that other more reliable research would lend more substantial and useful results.

**Rubric scoring.** Something else to consider is how those giving feedback or a score on an assessment affect the score or feedback. In Pomplun, Capps and Sundbye's (1998) predictive correlational study they looked at the validity of scoring on standardized tests to compare and measure the connection between those scores and the rubric related or unrelated elements used to score them. The sample included 1000 papers selected randomly from 10% of the student population of Kansas after the scoring of the standardized tests. The training program for the scorers assumed that, for systemic reform, all local teachers must participate in the scoring. The scores were taken from a variety of schools for both math and reading assessments. The score agreement comparison was made between local and state

scorers where the local scorers were teachers who participated in a training program hosted in a trainer of trainer model by the state scorers. The study looked at the relationship between the holistic scores and the studied features and rubric items. The study did show a high degree of agreement between state and local scoring with multiple noted non-rubric related items consistently appearing as predictors for the holistic scores. Though the significant predictors varied between tests, content and grade level, there were non-rubric related items that consistently showed up during the scoring process. One in particular, length of response, showed up in both the reading and mathematics scores. Researchers noted that correctness of answer accounted for 50% of the score variance across content and grade level.

In their discussion, Pomplun, Capps and Sundbye hypothesized about the potential causes of their predictors. They see a possible connection between a teacher's classroom experiences; how they take effort, progress, and completion into consideration in the scoring process; and the score differences where length of response was considered. This is not a limitation of the study itself, but addresses the issue they found with regard to the validity of scoring rubrics. They go on to mention that, if this is the case, one unusual way to account for this is to include those pieces in the factors measured by the assessment (Pomplun, Capps & Sundbye, 1998, p. 108). This is an interesting notion since around the same time as this study *Educative Assessment* (Wiggins, 1998) was published and suggested the same course of action. According to Wiggins (1998), this would involve using work samples to develop rubric criteria either with students or with other teachers that address the items that were not accounted for on the rubric.

The results from this study point to the importance of grading strictly from rubric criteria consistently though the authors do not directly state this fact. Since *SRL*, *SDL* and educative assessments all have student self-assessment embedded, typically through the use of rubrics, those rubrics need to be the main if not only operator when assigning a score or grade (Wiggins, 1998; Gibbons, 2002; Loyens, Magda & Rikers, 2008; Randall & Zundel, 2012). If a teacher uses rubrics, this study shows one of the possible concerns with their effective implementation. The fact that the study is well formed and substantiated by similar ideas promoted by Wiggins make it a strong candidate for generalizability toward the use of rubrics as grading tools. This also reinforces the point made by Wiggins (1998) that a performance assessment needs to include all of the criteria for the performance as well as the content. This also has a possible connection to the use of rubrics for student self-assessment. If a student is going to accurately self-assess, then they need to know all of the criteria they are being assessed on. With these ideas in mind I will need to make sure that I include high quality rubrics with any performance assessment that I administer. I will need to attend to all of the aspects of rubric creation laid out in *Classroom assessment for student learning: Doing it right—Using it well* (Chappuis, J., Stiggins, Chappuis S. & Arter, 2012, p. 227-248) as well as the development of performance criteria as laid out by Wiggins (1998). If I also take the extra step for allowing students to co-create portions of the rubric, then there is a chance for not only increased motivations but also for a better understanding of what the assessment criteria are and how to meet them (Tomlinson & Strickland, 2005; Gibbons, 2002).

**Summary and implications for future research.** This investigation has not only informed my teaching practice as a whole, it has also help me to better see the ideas laid out in *Educative Assessment* (Wiggins, 1998) and the *Self-Directed Learning Handbook* (Gibbons, 2002) . It has also demonstrated how those ideas relate directly to a student centered learning process. It has helped me to see how my assessments, feedback and classroom structure need to be adjusted and scaffolded so that students can develop their skills using various *SRL* strategies including but not limited to: self-correction, self-assessment, seeking aid, goal setting, self-monitoring, and utilizing feedback.

Some of the adjustments and scaffolding will focus around strategies that foster *SRL* including but not limited to: aligning my classroom learning environment to *SRL* readiness, aligning my assessments to allow for *SRL* strategy use, and using rubrics as well as educative assessments (either formative or summative) to help students develop *SRL* strategies. This also ties into the idea of feedback since adjustment to educative assessments will require the use of appropriate and effective feedback as described by Clark (2012) and Brookhart (2008).

Unfortunately, my investigation into what kinds of strategies teachers should use to foster *SRL* and *SDL* did not leave me with enough information about how I can teach and develop *SRL* strategies in ways that support diverse learners. The wide range of students included in the various samples, ranging from 4<sup>th</sup> grade to college seniors, did not show how the planning strategies impacted diverse learner's ability to become more self-regulated when compared to one another. One can, however, conclude that the overall themes will be noticeable across grade levels when teachers work to develop *SRL* and *SDL* strategies with their students. To gain further insights I will need to look for other research that can help inform my ability to support diverse learners as they develop their skills with *SRL* strategies. I will start by looking for literature using search terms such as: *diverse learners*, *SRL in group work*, and *self-assessment tied to self-efficacy*. I will need to experiment with some of the strategies mentioned in the various studies. One that particularly interests me is the idea of using formative and educative assessments, which allow for *SRL* strategy use, to help my students improve their scores on standardized tests (Wiliam, Lee, Harrison & Black, 2004).

## **The Use of Criteria and Feedback in Educative Assessments**

*by Sarah Gese*

In this section of the paper I explored strategies of instruction and assessment that lead to increased self-regulated learning for students. In order to do this, I focused my research on the following questions: what are the qualities of criteria and feedback that are most beneficial to increasing elementary students' conceptual understanding in different content areas, and what are important considerations for criteria and feedback to help students accurately gauge their progress in relation to an established learning target? My investigation was conducted through the lens of a pre-service elementary teacher, preparing to teach all content areas from a basis of constructivist pedagogy. My exploration of these questions will support our group's goal to become more familiar with practices and strategies that may guide our ability to plan effective educative assessments and instruction to support student's self-regulated learning.

In my fall student teaching placement, the feedback I received from my advising faculty addressed my inconsistency in the area of providing clear and accessible criteria for students within my lessons, particularly when addressing qualitative measures which reflected a need to improve my ability to design student assessments as a key component of planning for effective instruction. The criteria that I named for tasks in lesson planning for the edTPA were often not specific enough – addressing quantitative but not always qualitative measures, and did not consistently address concrete ways that students would know whether they were approaching, meeting, or exceeding the learning targets within specific lessons and the learning segment as a whole. My goal is to improve my ability to consistently name clear and relevant criteria for tasks and provide feedback that enables students to gauge their progress in a meaningful way, increases their ability to identify next steps and resources that may help them improve the quality of their work and further develop their understanding in all content areas for

elementary education. I believe that honing my ability to provide this type of support for students will allow them to become increasingly more self-regulated learners. Cultivating these skills will enable students to be more active and purposeful in their learning as they take stock of what they currently understand and need to know more about, communicate about their learning and needed supports, find applicable resources – including content-specific models and strategies, and make choices about areas to focus their time and attention on. Working towards supporting self-regulated learning empowers students with the mindset and tools that will serve them in any capacity as life-long learners.

According to Wiggins, in order for assessment to be formative, learners must be able to apply their understanding to future learning (Wiggins 1998). Instruction and formative assessment are intertwined and need to be planned for together (Marshall, 2010). Thus, assessment guides responsive teaching methods – including delivery and application of content, modeling skill development, and the use of targeted feedback and criteria. According to Clark, “feedback is pivotal to formative assessment and therefore to the development of self-regulated strategies among students” (Clark, 2012, p. 207). Feedback can aid self-regulated learning when used in conjunction with a task, as it guides students to next steps to close the gap between current performance and future performance on a task with the same or similar criteria (Clark, 2012). Educative assessment can scaffold student’s ability to monitor their current level of understanding and progress, support the development and use of study skills and self-management strategies to increase their competence, self-efficacy, and motivation. This empowers students by reinforcing a growth mindset around learning as they become aware that learning how to learn is a skill that will serve them throughout their lives.

Leveled assessment criteria and feedback on student progress based on established criteria that are aligned with the learning target and task makes the teaching task truly a learner-centered experience and helps hold teachers accountable for providing learning experiences that support student’s development of transferable metacognitive skills (Wiggins, 1998). A focus on developing a more in-depth understanding of this issue while not actively teaching will enable me to apply this understanding to future instructional planning with more strategic use of assessment criteria and feedback that supports students’ development as self-directed learners.

In order to find research that addressed the themes of criteria and feedback as related to formative assessment for an elementary context, I utilized the Ebscohost and ERIC research databases available through The Evergreen State College library to refine my search based on our initial grounding literature on educative assessments – an encyclopedia article, trade book, and literature review. I attempted to locate pertinent, peer-reviewed studies that had research questions most closely aligned with my individual research question and our group’s overarching question by using varied combinations of the search terms *formative assessment*, *educational assessment*, *instructional planning*, *education*, *feedback*, *criteria*, *assessment criteria*, *rubrics*, *self-assessment*, *peer-assessment*, *self-directed learning*, and *self-regulated learning*. I was able to find studies that addressed feedback and criteria in relation to educative assessment and self-regulated learning that were conducted within the content areas of writing, math, and science, but found it challenging to locate elementary-specific research on criteria and feedback.

The articles gathered to compile this paper have helped me identify some ways to refine my approach to assessments, criteria, and feedback to enhance student’s self-regulated learning as I prepare to enter the field, including considerations toward aligning feedback to its’ intended use and the need to scaffold student’s self-assessment abilities in order to make best use of criteria and feedback to extend their learning. This research has also highlighted some areas for further investigation as I look toward continuing to improve my practice; primarily the use of rubrics and exemplars to share both criteria and

feedback with students and to serve as a basis for self-evaluation and the best ways to implement and use self and peer-evaluations in the process of formative assessment to scaffold student's ability to self-regulate their learning.

**The use of rubrics for self-assessment in relation to criteria.** Andrade & Boulay (2003) used a quasi-experiment in the form of a posttest only control group design to explore whether or not a formal process of rubric referenced self-assessment had a measurable effect on student's writing. In examining prior research, they perceived self-assessment as a misunderstood, undervalued and underutilized practice. Also mentioned in the purpose of the study was the review of literature which stated that novice writers have trouble both recognizing problems with their writing and techniques for improving it (Andrade & Boulay, 2012). The authors hypothesized that self-evaluation would aid student learning and skill building if students were asked to reflect on qualitative measures of their work, going beyond simply scoring themselves with a rubric.

This study was implemented with support from the Edna McConnell Clark Foundation, which requested that schools already in collaboration with their foundation be used in the research. Two schools in southern California during the 1997-1998 school year provided the study's sample of 397 7th and 8<sup>th</sup> grade students in 13 language arts classes. The students from School A comprised 63.2% of the sample (251 students) and the students from School B made up 36.8% of the sample (146 students). The population of School A was described as consisting mainly of upper-middle class, primarily professional, suburban students with little ethnic diversity. Teachers at School A developed curriculum independently from one another. The students from School B were characterized as an ethnically diverse, working class, urban student population. Teachers at School B used integrated curriculum that combined history and language arts. The sample included 183 (46.1%) 7<sup>th</sup> graders and 214 (53.9%) 8<sup>th</sup> graders and counted 199 boys (48.1%) and 201 girls (50.6%) within the sample population.

Students were assigned by intact classes to either the self-assessment condition or the control condition. Equal numbers of 7th and 8th grade classes were in each group and the groups were counterbalanced according to ASAT scores. In cases where classrooms could not be matched exactly, the control group was favored with the higher ASAT score students, representing a stratified purposeful sample after the initial convenience sample of the schools chosen by relationship to the funding body of the study.

Students in both the treatment and control groups were asked to write two different essays one month apart; a historical fiction essay and a response to literature essay. Students in treatment and control classes were given identical instructional rubrics along with the assignment description of each type of essay and teachers in both groups briefly reviewed the assignment and the rubric. After writing a first draft, two 40-minute self-assessment lessons were conducted with the students in the treatment condition. This was a formal process of guided self-assessment. Students used markers to color code the criteria on the rubric with evidence in their essays demonstrating their writing had met each criterion. The first lesson focused on evaluation of their essays by the three most global criteria – ideas & content, organization, and paragraphs. When they found information missing from their essay that was listed in the rubric criteria, they were instructed to write a reminder at the top of their paper to add the missing information in their second draft. The treatment students were then asked to write a second draft and bring it for the second self-assessment lesson. The second lesson guided the students with the same process of evaluating their essays using the rubric – this time looking at four finer grained criteria: voice and tone, word choice, sentence fluency, and conventions. Treatment students were then asked to revise their essays

again without further intervention. Control classes received copies of the rubrics with the assignment descriptions and were asked to write at least two drafts, but did not formally assess their work in class.

The students' revised drafts were collected and scored by research assistants trained by the author who taught the self-assessment sessions with the treatment classes. The treatment group indicator was the primary question variable and was used to test whether membership in the self-assessment group was related to higher scores. Scoring commenced with a high level of inter-rater reliability. Additionally, Pearson correlations and *t* tests were used to ensure a more accurate assessment of inter-rater reliability than correlation alone, testing the relationship as well as the mean difference between the scores of the two raters. There was high agreement between the scorers, indicating strong internal validity.

Andrade and Boulay (2003) found that differences in scores favored the treatment group for the historical fiction essay, suggesting that there was a positive correlation between the formal lessons in using rubric-referenced criteria for self-evaluation and higher student scores, although the differences were too small to attain statistical significance. There was a higher positive effect of the treatment condition for girls, with the treatment group scoring .31 higher than the control group. This was a statistically significant difference that indicated there was a positive correlation between girl's use of a rubric-referenced self-assessment and higher scores on a historical fiction essay. The students with higher ASAT scores earned higher essay scores than those with lower ASAT scores on both essays. The treatment showed no relationship to student scores for the response to literature essay.

The researchers provided sufficient description of their treatment, assignment descriptions, the rubrics used, and the populations of their initial convenience sample which lend to the external validity of the findings. The treatment and control groups were assigned to either group by intact classrooms with very different populations and typical curricular approach between School A and School B, presenting some sampling issues and potential confounding variables that impact the generalizability of the study. The aspect of the study I am most interested in for potential application is related to the design of the self-assessment sessions and tools. The criteria for self-assessment first addressed bigger ideas and in a later session, finer-grained criteria specific to writing which, based on learning theory, is a practice that supports concept attainment. The idea of implementing a series of scaffolded formal reference points to guide qualitative self-assessment within a learning segment seems to be a practice worthy of further exploration, in the interest of extending students' conceptual understanding and their ability to gauge their own progress and apply feedback to improve their future performance.

**The impact of self-evaluation on achievement.** Ross, Hogaboam-Gray and Rolheiser (2002) used a quantitative quasi-experiment with a nonequivalent control group design with intact 5<sup>th</sup> and 6<sup>th</sup> grade classes to explore whether Grade 5 and 6 students who were trained how to evaluate their work would have higher mathematics achievement.

Students were given a performance task as a pre and post-test with different types of math problems. Treatment group teachers participated in 15 hours of training which consisted of modeled classroom activities: the development of a rubric, structured opportunities to share successful self-evaluation tasks and identify problems, in addition to time to collaboratively plan activities for student self-evaluation. During these sessions, the three authors of the study recorded teacher plans, successes, and problems as well as collecting artifacts consisting primarily of lesson plans. Treatment teachers received a handbook on teaching self-evaluation, a handbook containing performance tasks, and a document with examples of how to teach them (Ross et al., 1996). They also attended four brief team meetings during treatment to review progress and problem-solve issues that arose. The treatment took place over a twelve week period.

Treatment and control teachers taught grades 5 and 6 and were volunteers; seven of the twelve teachers in the treatment group had participated in the treatment group of an 8-week pilot study one year prior. The control and treatment teachers were purposely matched, exactly on grade taught and gender and within five years of experience teaching. The twelve teachers in the control group were not using systematic self-evaluation procedures, but were interested in “innovative approaches to student assessment” (Ross et al., 2002, p. 48). Control group teachers were promised an opportunity to attend a workshop on self-evaluation techniques and would review a collection of student assessment materials. The number of students was not described in the description of the study’s participants, which presents the potential for confounding variables since the study measure is related to student performance and self-assessment. The treatment group had six 30-minute lessons in which the teacher either demonstrated a self-evaluation technique or led students in a discussion of their self-evaluations. In one such lesson students co-developed a rubric to evaluate their work and received a teacher evaluation using the same rubric. Students received teacher feedback on their plans for meeting learning goals.

Self-evaluation was measured with 6 items: after pre-test students rated overall performance from 1 (*not well*) - 10 (*very well*). They then used the same scale to rate five dimensions of their problem solving: how well they understood the problem, made a plan, solved the problem, checked the solution, and explained the solution. Measures of self-efficacy consisted of six items identical to self-evaluation measure, except the focus was on expectations of future performance. Attitudes to self-evaluation were separately measured on a Likert scale with five positively worded items and five negatively worded items. The tests were independently coded by two experienced researchers using a four-leveled rubric for competence in three areas: *strategy for generating solution*, *accuracy of concepts and computations*, and *communication of solution*.

The findings of the study indicated that self-evaluation training in math had a positive impact on math achievement. The effect size was .40 SD with the analysis of covariance conducted. The outcome measure (dependent variable) was math achievement, the covariate was pretest achievement, and the outcome (independent variable) was study condition. Pretest scores predicted posttest achievement. Neither *affiliative orientation* nor age was associated with posttest achievement. The treatment lessons had a significant effect, with treatment students outperforming controls although the effect was small. In comparison with a similar pilot study, researchers determined that training in self-evaluation when applied to math only had an impact when students worked with these strategies over a long period of time (more than eight weeks), and when teachers received additional in-service training and curricular support. The researchers noted that when teachers and/or students see math as a set of arbitrary rules and algorithms, it is more challenging to implement self-evaluation techniques effectively (Ross, 2002). Some elements of effectively using self-evaluation to improve performance in math have to do with the teacher’s view of math as a “dynamic set of intellectual tools for solving meaningful problems” (Ross, 2002, p. 54).

The sample comparison of students between treatment and control was not explicit other than grade range (5<sup>th</sup> and 6<sup>th</sup>), little description was provided about the school settings, and there was not enough information about the sample to determine other potential confounding variables (socioeconomic status, etc.) that may have particular affiliations with school performance and self-efficacy ratings, an issue of internal validity. Not enough information is given about the prior study this one was based on which limits the ability to make a determination about the significance of comparative results. It would be useful to see another measure over a greater span of time than twelve weeks.

Although certain aspects of the self-assessment tool may have specific applications only to math, other aspects of self-evaluation as a necessary component of self-regulated learning may be generalizable. Training in the use of self-evaluation was shown to positively impact student performance. The findings suggest there are some key elements necessary to impact performance with this type of training, including a concept-oriented, rather than procedures-based approach to math and a *growth mindset* disposition on the part of teachers. This study raises questions about the complex dynamics involved in introducing self-evaluation as a learning tool that enables students to plan, monitor, and evaluate their work. The ability of educators to gain support and training that will help them effectively scaffold the use of self-evaluation for students presents a potential challenge. The theoretical framework of the study linked self-evaluation to self-efficacy and achievement which is an area of interest for further study.

**Feedback alignment.** This phenomenological study by Orsmond & Merry (2011) examined the relationship between intentions and application in the use of formative feedback. The literature review centered on the initial idea that the ability to engage students to become proficient self-assessors is the main objective of formative feedback. One study included suggested that “students need advice on understanding and using tutor feedback” (Orsmond & Merry, 2012, p. 126). Other studies looked at challenges students reported in applying feedback to other contexts, with findings that suggested if feedback was overly specific to the task, self-directed learning was inhibited (Orsmond and Merry, 2011). One hypothesis proffered was that tutor’s feedback was interpreted as a “pronouncement rather than a dialogue” (Orsmond and Merry, 2011, p.126). In response to this issue, they set out to examine feedback alignment in the context of three specific instances of feedback: *a.) a tutor’s intentions when they provide feedback to students; b.) how those intentions relate to the nature of the feedback provided; and c.) how those intentions are perceived and acted on by students* (Orsmond & Merry, 2011).

This mixed methodology study compared a quantitative analysis and coding of written feedback provided by tutors with qualitative interview data from both tutors and students to determine the relationship between tutor’s intentions for feedback, the actual nature of feedback provided, student’s perceptions of feedback, and their actions in response to feedback. The sample of the study consisted of six biological science tutors and 19 second-year undergraduate biological sciences students from a UK post-1992 university who gave informed consent to participate. The participants comprised 55% of the biological science tutors and 40% of the biological sciences second-year cohort. The areas of study of the participants ranged from molecular to environmental biology. Opportunistic (convenience) sampling was used to recruit tutors and random sampling used to recruit students.

The tutors gave written feedback to each of the undergraduate students on a specific piece of coursework which ranged from essays, portfolios, and short written responses, to project plans and pamphlets. The classification system for written feedback from tutors fit a small variety of types: *a.) provided different degrees of information about errors in the work, b.) suggested different degrees of further thinking, c.) gave praise*. An overall score for the piece of coursework was generated by summing the number of feedback instances in each category. The tutors gave equitable amounts of feedback to coursework with differing grades. All 19 students who had received written feedback were then interviewed.

Semi-structured interviews took place within three weeks of written feedback being distributed to students. This involved identifying topics surrounding the research questions, clustering and sequencing relevant topics, and designing informal interview probes. A phenomenological approach was taken toward the analysis of the interview data. Units of relevant meaning were identified within each interview

and clustered to identify general and unique themes. The tutor interviews were focused on the factors that influenced the writing of their feedback and their intentions in writing the feedback and how these corresponded with what they actually wrote. The student interviews focused on their interpretation of the meaning of the feedback and how the feedback helped their learning. Relationships between tutor's intentions, student's perceptions, student's usage, and type of feedback were then sought based on comparison of interview themes emerging and feedback classification scores. Quotations that the researcher's perceived as exemplifying these relationships were then taken from the interview transcripts. Additional informal discussions were held with tutors to clarify that the selected quotations had been interpreted correctly.

Orsmond & Merry found that, while there was a wide variation between individual tutor's feedback choices, in almost all cases praise was the most frequently used category. The overall *conceptualization of feedback* was the same for all tutors – they corrected errors, explained misunderstandings, and asked students to justify their answers, but did not address suggestions for future application although in interviews they expressed holding this belief about the use of feedback (Orsmond & Merry, 2011). This was interpreted as “an assumption on behalf of the tutors that students would know how to apply their feedback to future work as all tutors expected students to read and act on the feedback in some way and in doing this to achieve enhanced student learning with their feedback” (Orsmond & Merry, 2011, p. 131). The findings suggested that tutors did not understand how their feedback was perceived, whether or not it was being used, or how it might be applied. Students' considered feedback as error correcting or for encouraging intellectual debate, but most saw the feedback only as a way to better understand a specific tutor's expectations (Orsmond & Merry, 2011). The researchers suggest that a possible implication for tutor feedback being used in this way is contradictory to empowering students' skill development for future learning when they either focused on the feedback as it applied to the form of the work rather than the content or when a tutor's thinking subsumed the recipient's thinking (Orsmond & Merry, 2011). Based on their conclusions, Orsmond & Merry (2011) recommended that formative feedback focus on a greater variance of feedback that point to evidence of specific skills being developed, a greater use of exemplars and whole class feedback, the use of self-assessment, and guidance on further resources. In addition, they addressed the importance of discussing explicitly with students the intentions behind feedback in order to assist them in applying it to future work, as well as providing general whole group feedback to guide discussions and better prepare students for new work.

The sharing of the participants' actual words, the shared data tables of established categories for written feedback and examples of feedback that were classified in each category made the process of analysis in the study visible. Along with this, the use of member checks lend to the credibility of the study. The detailed steps of the research process lend to its dependability. The study is lacking a description of how tutors were matched with students for providing feedback. It was suggested that tutors had provided prior written feedback to students in the cohort but unclear if there was a prior relationship between particular pairings. Along with this, the issue of the application of feedback to a variety of types of work make it challenging to make an adequate comparison of feedback since the nature of the assessed work may lend to certain types of feedback.

One aspect of the study I can see transferring to an elementary setting is the consideration of dialogue with students receiving feedback to understand their perception of it and ascertain their ability to apply it to future work. They may benefit from having the application of feedback modeled, scaffolding a metacognitive process important to self-regulated learning. Another consideration for improving my effective use of feedback is where to direct student's attention to larger skills being developed in their

work so they are able to attend to qualitative aspects of their work and their ability to communicate their thinking rather than focusing solely on quantitative aspects and on formatting of their work.

**The use of exemplars, self and peer assessment, and feedback alignment.** This study by Orsmond, Merry, & Reiling (2002) was based in a literature review that explored the trend of using student-focused approaches to teaching in order to improve the quality of student learning. In response to the literature, the researchers examined several ways of engaging active learning. They defined *active learning* as: student involvement in searching for personal and academic meaning in their studies, students taking greater responsibility for their own learning, and students prioritizing skill acquisition – seeking to understand the attitudes and tasks associated with a body of knowledge (Orsmond, 2002). Other research included in the basis for the study suggested that the formative use of peer and self-assessment aids student understanding (Orsmond, 2002). In another study on learner-constructed criteria, the results suggested that students were less able to discriminate between marking criteria they created themselves and criteria that was provided to them. To address this, the authors added an emphasis on formative feedback combined with the use of exemplars as they set out to explore:

- a. Does the use of exemplars allow students to achieve greater understanding of the marking criteria?
- b. What are ways that peer and self-assessment practices could be more effectively used in the curriculum?
- c. How to encourage students to reflect more on the assessment process as part of their own learning?
- d. How to provide meaningful formative feedback within the assessment context and introduce the students to the process of peer review? (Orsmond, Merry, and Reiling, 2002)

This was a mixed methods study that focused on a quantitative comparison of student self-assessment marks, peer assessment marks, and tutor's marks on individually constructed scientific posters. Qualitative data was collected in the form of each group's marking criteria and the associated student/tutor definitions of their criteria. Students and tutors worked together in small groups to establish the grading criteria for completing the posters while looking at quality exemplars. Students then created a poster, referencing the established criteria. Students self-assessed their work and another group member's work, according to their group's established criteria. Tutors scored the work according to the group criteria. Peer and tutor scores, self and tutor scores, and student-student marking comparisons were made. Participants then responded to a questionnaire about what aspects of the peer and self-assessment process were helpful to understanding and performing well on the task.

Participants in this study were first-year Environmental Sciences and Applied Biology undergraduates at Staffordshire University studying a module called *Work Experience and Personal Development*. None of the students had taken part in peer or self-assessment exercises at the university prior to this study. There were 22 students in total who worked in groups of three or four to develop and employ their marking criteria. Each student constructed an individual poster and marked theirs individually.

The findings demonstrated that a close agreement between tutor and student existed for marking individual criteria, and slightly more agreement was demonstrated between tutor and student for the peer assessment (54 - 81%) than self-assessment (50 -80%). The findings suggest that the use of exemplars in

conjunction with student constructed marking criteria enhanced the agreement between tutor and student when compared with two prior studies (Orsmond, 2002). According to the questionnaire responses, students reported that the discussions with tutors aided overall understanding. Students also reported benefitting from peer assessment. The use of exemplars aided understanding the task beyond just the visual aspect of creating the artifact for assessment (Orsmond, 2002). According to the data collected, participation in discussions with tutors and referencing exemplars while constructing marking criteria helped students to critically examine and see differences between criteria and enhanced their understanding of the task requirements. The data collected for this study were then compared with findings from previous studies using the consistent variables of peer assessment, tutor assessment, and self-assessment with a correlational test, although there was not enough information provided about the population of the studies being compared is to know how potential confounding variables are aligned between the studies. Additionally the authors' named the tutors' familiarity and practice with using marking criteria and potentially greater ability to be objective in assessing the posters as a potential limitation to the study.

The thick descriptions of the context and process of the study, the inclusion of relevant qualitative responses to the questionnaire, and the triangulation of qualitative and quantitative measures lend to the trustworthiness and transferability of the study. One aspect of the study that I am interested in exploring is the use of exemplars to aid student's understanding of criteria. This study also raised further questions for me about the usefulness of student-generated criteria for a task, with or without exemplars. I feel both of these issues are worthy of further research in the interest of learning more about helping students understand task criteria in order to aid both content understanding and provide a reference point for feedback.

**Sustainable feedback practices.** In this qualitative phenomenological study Carless, Salter, Yang, & Lam (2011) explored what practices, relevant to a framework for sustainable feedback, were reported by a sample of ten award-winning teachers in the University of Hong Kong. For the purpose of their inquiry, they defined feedback as *all dialogue to support learning in both formal and informal situations* (Carless et al., 2011). This study consisted of a series of ten semi-structured interviews, conducted to permit participants to describe and discuss their feedback practices. These interviews prompted dialogue, as subjects were probed regarding their responses. Interviews were recorded and transcribed verbatim. There was no *priori position* taken before data collection. The framework of sustainable feedback used to interpret the data evolved as interviewing proceeded, initial data analysis unfolded, and relevant literature was further studied.

Prior research consulted for the literature review introduced the notion of sustainable feedback and three strands were explored, which included the following; feedback that had impact beyond the task to which it related, enhanced the student's role to generate, interpret and engage with feedback, and demonstrated congruence between feedback and guidance via dialogue that arises from learning activities (Carless et al., 2011). Carless et al. define sustainable feedback as "dialogic processes and activities which can support and inform the student on the current task, whilst also developing the ability to self-regulate performance on future tasks" (Carless et al., 2011, p.398 ).

A preliminary content analysis identified two main strands of feedback strategy – conventional methods, and those that were aligned with the framework for sustainable feedback. The practices were coded and categorized by one author, verified or amended by second, then further debated within the research team. When questions arose, they were brought back to the subject for clarification. The reported

practices that arose were used to theorize and draw out principles for the development of effective feedback.

The researchers found that the themes that arose for *sustainable feedback* included: two-stage assignments and their role in facilitating feedback, including peer review or peer feedback processes as part of assignments; feedback that promotes dialogue – students reflect on their own performance and interact with professor’s feedback on an oral presentation; self-evaluation (pre and post workshop assessments strengthened metacognitive processes); technology supported feedback (online dialogue regarding drafts of work in progress, aided in ability to give timely feedback). This study suggested student self-regulation is a necessary part of feedback processes within a sustainable feedback framework. The practices outlined could potentially better support student’s self-directed learning than conventional methods of feedback, including *one-way* feedback.

The study was situated in a literature review that included a model which suggested seven principles for good feedback practice. The authors linked two of these principles to the discussion of their finding, including feedback that facilitates the development of self-assessment and reflection in learning, and that which encourages teacher and peer dialogue about learning. The study lacked thick descriptions about the context of the learning and feedback being discussed by participants, the actual questions the researcher asked, and what the participants’ measure was for determining a certain method of feedback to be effective. The authors did include several transcriptions of interview segments and their corresponding interpretations of participant’s responses, which served to illustrate their process for categorizing the interview data. The difference between conventional feedback methods was not clearly defined for comparison with sustainable feedback methods. The study used a small sample of college level educators, which may make general transferability challenging to an elementary context, given the developmental differences between adult learners and elementary students.

I am most interested in further exploring sustainable feedback as a practice and, potentially, as a framework for providing formative feedback to students. The seven principles of good feedback practice mentioned in the initial literature review may offer a valuable starting point for further inquiry. I wonder if some universal elements of effective feedback have been outlined that could help me to incorporate feedback that is appropriately aligned to the task, the student, and the development of their self-regulated skills into my practice. Further inquiry in this area could possibly extend my current understanding of the qualities of effective feedback and important considerations for implementation, as well as the group’s larger question about practices that improve instruction and assessments in ways that aid self-regulated learning.

**Summary and implications for future research.** In reviewing current research to address the qualities of criteria and feedback that support students’ ability to increase their content-specific understanding, gauge their progress in relation to an established learning target and become more self-directed as learners, I came across a number of strategies which seem worthy of further research and experimentation. These include the consideration of multiple feedback channels (individual written, group oral, and individual oral) in matching the right type of feedback at the right time to support students’ learning and the potential combined effect of feedback practices (Randall & Zundel, 2012). Another important consideration is planning for feedback as a dialogic process in order to help clarify students’ understanding and increase my awareness of their ability to apply feedback to their next steps (Randall & Zundel, 2012, Orsmond & Merry 2011). The idea of a sustainable feedback framework is a compelling one; I am interested in ways this could help me plan to provide for feedback that is specific enough to students’ current work, yet encompasses some bigger ideas about the type of skill development

that would be useful across settings (Orsmond & Merry, 2011). I would like to learn more about how to determine the appropriate balance of specificity to a task in regards to providing criteria and feedback that enables the development of the broader scope of skills used in self-regulated learning. The use of exemplars for making task requirements explicit and helping students develop a clear understanding of qualitative criteria is another area of interest for further research (Orsmond, Merry, & Reiling, 2002, Orsmond & Merry, 2011). Another important theme that arose throughout my research was the role that self-evaluation plays in the ability to use feedback and develop self-regulated learning strategies (Randall and Zundel, 2012, Merry, Orsmond, and Reiling, 2002, Carless, Salter, Yang, and Lam, 2011). The theoretical framework for the Ross, Hogaboam-Gray, and Rolheiser study (2002) connects self-evaluation to self-efficacy, motivation and achievement and the findings of the study consider self-evaluation as a form of feedback that has demonstrated a positive correlation with student achievement, which leads me to wonder what about these connections I should be attending to in my classroom for the betterment of my students.

The part of my question that was not specifically addressed was the specific content area contexts for elementary school. Although I chose research that represented studies in math, writing, and science, I'm not certain any content-specific information related to the use of feedback and criteria were revealed in this review of the literature. In the next steps of this investigation, I will look for further readings on the concept of sustainable feedback as well as research on the use of self-evaluation as a metacognitive strategy. Additionally, I will consider ways that multiple types of feedback could be incorporated throughout a learning segment, attempt to more closely match types of feedback with their intended purpose, and look for what supports students need in order to make use of feedback.

### **Self-regulated Learning Development and its Effect on Self-Efficacy and Conceptual Understanding in Science.**

*by Kat Vanek*

In this area of the research paper I examined the connection between formative assessment, self-regulated learning, and self-efficacy in science education with regards to middle and high school students. As a soon to be teacher, the interconnectedness between the different themes will help unravel the necessary need and implementation for effective formative strategies to build self-regulation and the awareness of the self-efficacy of students. I will be receiving credentials to be able to teach in secondary science classrooms. Due to my interest in teaching science, I am curious about the effect of self-regulated learning development on students' science conceptual understanding and how/why self-regulated learning, self-efficacy has an effect on academic achievement. My research is focused on the following question: what are specific ways students can become self-regulated learners in order to better understand science concepts and increase self-efficacy beliefs? This question helped me narrow my focus inquiry down to formative assessment, self-regulation and self-efficacy.

I chose the focus area around formative assessments because of my student teaching experience and analysis of student learning from the edTPA. I realized from the analysis of student learning that many students could have benefited from different formative assessment strategies and self-regulated learning skills to monitor their own progress toward the understanding of science concepts. During my fall student teaching, there were specific formative assessments established, but they were geared more towards content understanding than self-regulated learning. It would have been beneficial for students to

have regulated their own learning in order to see where they were at in relation to the learning target. Discussion or awareness of self-efficacy beliefs around science within my fall placement was very limited. Introducing the importance of recognizing self-efficacy beliefs is a goal for spring student teaching. I believe that researching self-regulated learning and self-efficacy will better support my understanding of different strategies to use in the classroom and enable me to increase students' conceptual understanding. Researching this topic will allow me to better meet the needs of students in public school classrooms because I will gain an enriched understanding of the relationship between self-regulation and self-efficacy. I will, in turn, be able to utilize specific strategies within the classroom and become more aware of how specific beliefs around science learning affect academic outcomes. It is important as a teacher to be a support system for students and help them utilize specific self-regulating skills around self-reflection, self-assessing, study skills, goal setting in order to promote conceptual understanding (Pape, Bell & Yetkin, 2003; Dibenedetto & Benbenutty, 2013; Brookhart et al., 2004).

Specific ways that I was able to research include looking on the Evergreen State College online library system and journals. Ebscohost and JSTOR became great resources that had studies readily available that incorporated specifics of my research question. The key terms that I used to search include, *self-regulated learning*, *formative assessment*, *formative assessment strategies*, *self-efficacy*, *self-regulated learning in science*. Within the search engine I was able to select specific limiting factors including the word *adolescent*. The specific age range that I was focused on for this project was middle and high school students. This narrowed my search down, with the exception of one included study that used college age students as its sample. The studies found ranged from being mixed methods to quantitative experiment based. Limitations of the research revolved around the age range of the students, content area, and limited thick descriptions. Three of the research experiments discussed science (part of my research question); social studies, and the last revolved around mathematical understanding. It is important to mention these specific limitations because this could affect the generalizability of the findings to science (the strategies used could have just been for social studies or math) and the applicability of the self-regulating strategies used based on age range. The specific strategies or curriculum implementation could have been content specific in social studies and math; and may not be effective strategies for use in a science classroom.

General outcomes from my research, included: the greater use of students utilizing and being aware of self-regulating strategies indicates a potential for higher academic outcomes (Dibenedetto & Benbenutty, 2013); self-efficacy beliefs can have an effect on self-regulating strategies (Zimmerman et al., 1992; Pape et al., 2003; Dibenedetto & Benbenutty, 2013); and having a community classroom that values student centered instruction including the use of formative self-regulating strategies can help promote mathematical and scientific conceptual understanding (Granger et al., 2012; Pape et al., 2003; Bell & Cowie, 2001; Brookhart et al., 2004).

**Self-efficacy beliefs, self-regulated strategies and science achievement.** DiBenedetto & Benbenutty (2013) were able to use a voluntary survey sampling method with 113 undergraduate students enrolled in science courses at a large public college. This quantitative study examined how self-regulated learning and self-efficacy played a key role in science achievement at the beginning and end of a college course. The influence of “gender, ethnicity, childhood and adolescent socialization experiences were also examined” to discuss whether these variables influenced self-regulation and science performance outcomes. Dibenedetto & Benbenutty (2013) mentioned specific adolescent socialization which included exposure to science experiences related to going to museums, science books, science clubs, social modeling and parental expectations that could impact self-efficacy and self-regulation strategies. The

researchers had specific questions within the study that informed the study and were answered within their outcomes.

Researcher questions included: (a) Do students' motivational beliefs and self-regulatory learning strategies change over one science course? (b) Do students' childhood and adolescent science experiences relate to motivation and use of self-regulated strategies in a science course? (c) Are changes in motivational beliefs, use of self-regulatory learning strategies, and final course grade correlated? (d) Are final course grades associated with changes in motivation and use of self-regulatory strategies over time even after controlling for demographic factors? (DiBenedetto & Benbenutty, 2013)

The students who were involved with the random sampling were surveyed once at the beginning of the semester and at the end. The survey questions included the type of support students received help with or self-regulating support. For example, questions asked included whether students used the library, peer to peer discussions, and/or emailing their professor. The survey also asked students to discuss their ethnicity, adolescent background and if a parent (mother) had received a post-secondary education. With this information, the researchers were able to see if there was a change or performance outcome difference in students from diverse backgrounds. The researchers concluded that "Asian American students and students from other minority groups performed lower in their science courses compared to Caucasian students" even after all the specific controls set in place (DiBenedetto & Benbenutty, 2013). The outcome of the study concluded that changes in self-efficacy related to the final course grades. There was a significant difference between male and female help seeking behavior, which could be attributed to different socialization patterns. There is most likely a direct correlation between self-efficacy and performance. The "judgment of one's current knowledge and confidence" has to be "consistent with performance, which reflects a high level of self-regulation". DiBenedetto & Benbenutty (2013) mentioned that most likely the higher the final course grade, the higher the self-efficacy which in turn shows a parallel connection with increased self-regulation. From the comparison of the pre and post assessment the course itself may have had an "impact on the students' confidence, outcome expectancies, and use of strategies."

The study is generalizable because there was sufficient description of pre and post tests given to undergraduate students with space in between these tests; this increased the reliability of the tests. The researchers also mentioned the well-established and reliable testing instrumentation which increased the internal validity. A multiple linear regression analysis was used to see if there was a relationship between final course grades and self-regulated learning strategies. A Likert Scale was used on both the pre and posttests, answers would vary from (1) *strongly disagree* to (7) *strongly agree*; using this scale most likely contributed to accurate results and unbiased interpretations from researchers, which increased the objectivity of the scale. A limitation of the study includes a medium sample size of 113 students that voluntarily accepted to be part of the study.

The findings of this study are beneficial to my overall research question around the specific impacts that promote self-regulated learning. The research focus was about how self-efficacy influences self-regulation and therefore did not discuss the aspects or benefits of formative assessment potentially improving self-regulated learning. One of the most important findings from this research that I will use within my classroom and research project is the relationship between self-efficacy and self-regulated learning. The importance of how students feel and think about their science skills and knowledge has an

impact on how well they will self-regulate to improve their grades. The connection to my research question is that there are a multitude of self-regulating strategies that can contribute to science achievement. Specific self-regulating strategies within this study that changed over the course of the semester included help seeking behavior from study groups or peer to peer, and some students demonstrated the need to go the library more during the latter part of the semester. Another aspect to note is that the sample consisted of college students in an intermediate science course while my main focus is on working with middle and high school students. A reason for mentioning this discrepancy is that adult students (those in college and beyond) may bring an array of tools, experiences and self-regulating strategies that younger students may not yet acquired or refined those skills. Insights that arose and need further explanation or awareness include the specific reasons why students from diverse backgrounds performed lower in the science courses. Did the type of self-regulation matter for students? Did some students seek alternate forms of help seeking behavior than other students? Are self-regulating behaviors culturally specific? The next study discussed how the specific form of instruction, student centered versus teacher centered, can play a role in science conceptual understanding.

**Student-centered instruction in science.** Within this study, Granger et al., (2012) used a randomized cluster experimental design to compare the effects of a student-centered versus teacher-centered science classrooms in elementary school and look at the effect of teacher self-efficacy. Researchers implemented specific curriculum with the teachers that used the student-centered approach (treatment group), unlike the control group of teacher-centered curriculum that used the district mandated space science textbooks. The overarching research question was around student versus teacher-centered classrooms and whether or not that has an impact on science conceptual understanding.

The background reasons that the researchers wanted to conduct this study are based on the main themes of the National Research Council around science acquisition. The four main themes included, students need to decipher explanations of the world around them; use evidence to support claims; understand how scientific knowledge gets developed and participate with peers around scientific practices. These themes were used as the benchmark for this study based on the space science concepts and how students and teachers compared based on whether they were in the treatment (student-centered) or control (teacher-centered) group.

This study encompassed a wide range of contexts including suburban, rural, and low-high socioeconomic standing (SES). The randomization of the design was limited to “grade level, SES, school statewide assessment performance, and student ethnic diversity” (Granger et al., 2012). A total of 2,594 fourth and fifth grade students’ participated with 66 treatment teachers and 59 control teachers. The teachers were randomly selected to be in the treatment or control groups. There was a pre and posttest for the students right after the unit and again five months after the unit. The teachers filled out a pre and posttest based on self-efficacy towards science teaching and had research observers who witnessed their implementation of the treatment or control curriculum two to three times during the unit. The trained observers used the *Reformed Teacher Observation Protocol* to measure the alignment of teacher implementation of the curriculum with the student-centered science instruction.

Granger et al (2012) concluded that students who were in student-centered classrooms where students were engaged with the use of scientific models and the use of evidence to justify scientific claims developed the knowledge to be more scientifically proficient. Teacher self-efficacy also had an impact on student understanding of models and being able to justify with evidence. Teachers who started the experiment with higher self-efficacy had students who were more scientifically proficient. Granger et al (2012) mentioned that there was an alignment between the scores teachers received on the *Reformed*

*Teacher Observation Protocol* and student engagement in learning. The findings suggested there was a positive relationship between student-centeredness and effective teaching.

The findings are generalizable to my research question around supporting students in science. There was a large population size of students and teachers which increases the generalizability of this study. Students were given a pre and posttest with a second posttest given five months after the unit, which strengthens the likelihood of this type of experiment being reliable and results would most likely be similar if it was replicated. There was specific curriculum used for both the treatment and control groups and teachers were observed two to three times during the unit by trained observers in the classroom which increased the reliability of this study. The trained observers used the *Reformed Teacher Observation Protocol* to ensure consistency of the observations with all teachers. The idea around having a student-centered classroom approach can be a way to promote self-efficacy and establish self-regulating strategies. Keeping students at the center of their learning will most likely lead to enhanced conceptual science understanding. They may begin to develop awareness around and regulate when they understand a science concept or when they do not understand a concept.

**The role of formative assessment in science education.** Bell & Cowie (2001) studied the strategies for and importance of using formative assessment methods. The outcome of students was dependent on the implementation of specific activities and formative assessment strategies. This two-year research project in New Zealand worked with teachers to investigate classroom formative assessment for students ages 11-14 while implementing science curriculum. The research was called the Learning in Science Project and was conducted in collaboration with the Ministry of Education.

Specific key areas for the research included: (a) To investigate the nature and purpose of the assessment activities in some science classrooms. (b) To investigate the use of assessment information by the teacher and the students to improve the students' learning in science. (c) To investigate the teacher development of teachers with respect to classroom-based assessment, including formative assessment. (d) To develop a model to describe and explain the nature of the formative assessment process in science education. (Bell & Cowie, 2001)

This study implemented a mixed methods approach. This is more of a case study research due to the qualitative nature of the study; specific points of data collection that were used included surveys, interviews, and observation of participants (Bell & Cowie, 2001). A total of ten teachers were used as a sample for this study, which included nine science teachers and one teacher of technology. The key areas of focus included collection and surveys on teacher's views of assessment which were monitored throughout the whole two-year project; observation of teachers and students by researchers to assess the use of formative assessment strategies and activities; and lastly, the development of these formative assessment strategies and the data received from the assessments for future refinement. Teachers and researchers collaborated with this development over 11 days through the two-year project and data for the research was specifically collected by field notes, recorded discussions and surveys (Bell & Cowie, 2001). A total of 114 students were interviewed over the two year project from the selected classrooms of their teacher.

There were specific formative assessment purposes that teachers found crucial in their classrooms through the days that teachers collaborated with researchers to construct these assessments. In the research study teachers identified specific characteristics of formative assessment; two of the characteristics that teachers identified included, "formative assessment is done by both teachers and

students” and the need to identify a specific purpose for the formative assessment within the content (Bell & Cowie, 2001). Specific limitations that were identified included student disclosure. Students voluntarily disclosed their ideas on the formative assessments, teachers pointed out that for some students the way of disclosing ideas was not automatic and sometimes led to limited thinking. The reasons for this nondisclosure for some of these students were based on their relationship with their teacher, potential harm of ideas and assessment strategies.

This study has limited transferability due to brief descriptions of the students, demographics of the school and location beyond it's location in New Zealand. A positive aspect to the limited description of students was the extensive description about the teachers who were either “beginning or experienced and may have had management responsibilities in the school.” Teachers chose which class would participate in the study. A total of ten teachers were involved with 114 students who were individually interviewed. Each of the teachers and their students were treated as a separate case study within the context of the overall research. There was increased credibility because of the prolonged and substantial engagement of the researchers with the students and teachers over the two-year research project. Data collection consisted of a variety of qualitative techniques that were triangulated to insure strengthened credibility of the research.

I found this case study somewhat important for my personal and group question as it discussed the role and importance of formative assessment in the classroom. This case study brings up ideas around the value of formative assessment in the classroom for both the teachers and student alike. Also, it discussed the need for refinement of assessment strategies by the teachers in order to inform future instruction or current understanding of concepts in science. It is important to understand how formative assessment can help the students but also the teacher to be able to recognize student learning, engagement or needed support to enable students' self-regulated learning. The specific formative assessment that teachers used was not made explicit; I am curious whether or not specific self-regulating strategies were utilized, for example goal setting and self-reflection on current understanding.

**Self-efficacy beliefs and goal setting.** Within this quantitative study, Zimmerman et al., (1992) addressed the issue of how students feel about their self-efficacy, setting of personal goals and parental goal setting. The overarching research question was about the connection between students' self-efficacy, self-regulated learning, and the effect they had on academic achievement in social studies classrooms. A total of 102 students and 5 teachers participated in the study from two high schools in a large Eastern city. The sample context included a diverse group of students from a school that served the lower middle-class neighborhoods. The ethnicity of the students that participated includes, 17% Asian, 34% Black, 23 % Hispanic, and 24% White (2% did not identify an ethnicity). The specific content area that the researchers focused on was 9<sup>th</sup> and 10<sup>th</sup> grade social studies, which was selected because it did not involve ability tracking and it is a required course for all students at the school.

This was a quasi-research design in which students and parents set goals at the beginning of the semester. Students also filled out an initial questionnaire at the beginning; the specific items within the questionnaire consisted of 11 questions on self-efficacy for self-regulated learning and 9 questions about self-efficacy for academic achievement. A few examples included; how well can you learn science, social studies, and English grammar; how well do you finish homework by the deadline, plan for schoolwork, and organize school work? They were also asked to provide information about their age, sex and ethnicity. The questionnaire had main themes that the researchers wanted to address including perceptions of “students' self-efficacy for self-regulated learning and their efficacy for academic achievement” (Zimmerman et al., 1992).

Specific outcomes of this experiment included how the setting of personal goals for students at the beginning of the semester had a direct impact on the students' achieving these goals. Zimmerman et al., (1992) discussed how self-efficacy played a major role in the setting of the academic goals; students who set higher goals had higher self-efficacy beliefs. The researchers mention that the goal setting acted as a type of commitment for the student to actually reach those goals. The parents of the students in the study were also asked to provide academic goals for their children and the goals that parents set for their child was much higher than students' set for themselves. The researchers noted that there was not a significant correlation between parent goals and the influence that had on students' goals for themselves. It is noted that academic achievement is something that should be supported and "fostered" by creating academic experiences that lead to student awareness of academic self-efficacy beliefs (Zimmerman et al., 1992; Pape et al., 2003).

The researchers mentioned that a drawback to this research was the specifics of how and why the students' self-efficacy for regulated learning and academic achievement increased or may be different from student to student. There was not a treatment or control for self-efficacy, regulated learning or attaining academic achievement.

A significant causal path was found between efficacy for self-regulated learning, efficacy for academic achievement, and academic attainment. Students who perceived themselves as capable of regulating their own activities strategically are more confident about mastering academic subjects and attain higher academic performance. (Zimmerman et al., 1992).

Teachers had their classes randomly selected and social studies was not part of ability tracking, which helped control for differential selection and students were asked to be a part of the study within those randomly chosen classes but they could opt out with parent permission. There was a detailed description of the questionnaire and comparison from previous years' grades. Cronbach alpha reliability tests were performed for each of the measures being used. The scales proved to be highly reliable ".87 was found for the 11-item self-efficacy for self-regulated learning scale and a coefficient of .70 was found for the 9-item self-efficacy for academic achievement scale" (Zimmerman et al., 1992). The scale being highly reliable increased the internal validity of this study. A limitation to this study that most likely would decrease the generalizability is that there was no control or treatment group; the questionnaire was given at the beginning but the time in between was not accounted for by the researchers. There could have been unforeseen circumstances that would affect the final grade for students but those were not discussed by the researchers. Little information was given about the teachers or the specific social studies curriculum they were using or if there was a difference in curriculum between classes.

One of the positives that came out of this research and is generalizable to my research question about self-regulated learning is the positive relationship between higher goal setting and higher self-efficacy. Based on this experiment, I most likely believe that students who have more established tools and strategies are more likely to have increased self-regulation based on the increased self-efficacy. This study is interesting because it delves into the idea of self-motivation and personal beliefs about efficacy being a factor for academic achievement. It does not tackle the issue of formative assessment but motivation may be linked to self-efficacy. Another question that is raised from this experiment is around building, creating and fostering academic experiences. From the research that I have read I am now seeing a link between effective academic experiences, building a community classroom, and the connection of

self-regulated learning and heightened self-efficacy. Putting a value on the role of self-regulated learning and its implementation in the classroom can have an effect on the thinking that is necessary.

**The role of self-regulated learning and mathematical thinking.** Within the math context, Pape et al., (2003) mentioned that there has been an intentional movement to help promote self-regulated learning and specific strategies to support teachers and students in order to progress mathematics understanding. This qualitative experiment acknowledged this movement and recognized the importance of self-regulated learning in order to engage in deeper conceptual thinking of math concepts. The main underlining research question is centered on building a community classroom around self-regulating learning and how that supported students' conceptual understanding of math. The general outcome concluded that implementing specific math strategies for learning, building a community environment in the classroom that supporting these strategies, and self-regulated initiatives can all lead to improvement in student understanding. Teacher implementation and awareness of the need for the strategies is also a key factor.

For this study, the researchers had a previously established relationship with the 7th grade math teacher because of their involvement in the same two-year professional development program. The first-year of the professional development involved the math teacher working with the researchers to develop a classroom environment that would support self-regulated learning and mathematical understanding. The second-year of the program was when the first year components came to fruition and the initial experiment was enacted with the students' involvement. The classroom environment that was created included specific key parts, "a) the nature of mathematical tasks; (b) the inquiry micro-culture built on significant classroom discourse and co-construction of knowledge; (c) the classroom norms for co-participation;(d) the cyclical nature of SRL behaviors and attributions; and (e) building positive self-schemas toward strategic behavior" (Pape et al., 2003). The specifics of the research design included the planning stage of the type of classroom environment and strategies that the teacher wanted to cultivate, looked at the outcomes and restructuring of teaching and students outcomes based on those results.

The school that this experiment was being incorporated into was located in an urban setting in a Midwestern city. There were two math classes that were used for the study. One of the classes had students who were a year ahead in math; they were in pre-algebra in order for these students to be in algebra in the 8th grade. These students excelled in math and had above average experience (Pape et al., 2003). The second class had students that were taking the regular 7th grade mathematics curriculum. Both of these classes were still following the district and state mandated pre-algebra and 7th grade math curriculum. The school had a unique situation wherein students had to enter a lottery system in order to be admitted into the school whose focus was on alternative arts. The school population had a 49% free and reduced lunch rate and a predominantly African American demographic at 58%.

Specific areas that informed the practice of the researcher and teacher were discussed to ensure the likeliness of concise and tangible outcomes. The study had strong internal validity within the experiment characterized by the planning sessions with researcher and teacher; videotapes of instructional practices; teacher written reflections; and student responses and reflection on the strategy observation tool (Pape et al., 2003). Students were asked to record daily in their strategy observation tool. This tool was meant as a formative assessment for both the teacher and student to see the different self-regulating strategies they used during the class and at home with homework. These tools were then collected every nine weeks (at the end of each grading period) for a year to see self-regulating strategy progression and any correlation between increased mathematical understandings. The researchers and the teacher realized after the first collection of these tools from students that they needed to modify them in order to benefit

student self-regulating strategies. They added categories including goal setting, seeking social assistance, self-consequences, self-evaluating, organizing and transforming.

There was a multitude of outcomes that the researchers noticed from this two year teaching experiment and student reflection and observation. One of the main observations that the researchers discussed was how important it was for students to realize their importance in the learning process and attribute specific learning outcomes with their strategic behavior and self-regulating strategies (Granger et al., 2012). Overall, students within the classroom were better able to discuss mathematical understandings and reasoning; and were exposed to a number of self-regulating strategies (Pape et al., 2003). Specific statements from the students on the observation tools made connections between choices they would make about studying and the affect that would have on their grades and feelings of efficacy (Pape et al., 2003; Zimmerman et al., 1992).

This study is transferable to my current area of interest with self-regulation and self-efficacy. Specific points that make this study transferable include the progression over two years (planning for one year, implementation the second year). There was also significant discussion around the school population being diverse and who was eligible for free or reduced lunch prices. The limitations to this study include there being only one case study with one teacher and that there was only treatment groups instead of having both a control and a treatment group to see differences amongst groups. Another aspect of the limitations that were not widely discussed within this study was how the advanced math class compared to the on track math class.

There were many data points used that were triangulated in order to ensure a well-rounded outcome. Specific forms of data that were collected included field notes supported by video tapes, written reflections by the students and teacher, students' use of the observation tool, and a conversation in class about the effectiveness of the observation tool. There was also peer debriefing amongst the researchers and teacher that became a recursive process and influenced the refinement of the observation tool. Specific distinctions and alterations were made to the first observation tool in order to make it more beneficial for students to gain self-regulating strategies that would promote discussion of their intention to study for tests/quizzes and reflections about performance and how well they thought they achieved on a test. Due to the sampling size of a total of 55 students and the long duration that the study took place, over two years, the findings are dependable and most likely would happen again if the same strategies were followed.

Even though this study is about mathematics in a middle school and not about science, the overarching goal of the importance and necessity for self-regulated strategies is visible. Within the context of the strategy observation tool, this is most likely a type of formative assessment for both students and teachers even though the word usage of formative assessment was not made explicit within the study. Through this experiment it seemed incredibly important for students to be able to write down their self-regulating strategies in the observation tool every day. This type of formative assessment seems crucial for supporting students' conceptual understanding, awareness of useful strategies, and the connection to academic outcomes. Another aspect of this study that needs further inquiry was the importance of forming a community classroom in order to build conceptual understanding of math alongside self-regulating strategies. What builds a strong community within the classroom? I am curious to see if the same tools the researchers and teacher used would be just as beneficial in a classroom where the formation of a community classroom is not the primary focus and why or if that would make a difference.

**Summary and implications for future research.** The research examined extends my rationale and relates to my question by going into detail about the effect that specific formative self-regulating strategies can have on a student's academic outcome and their self-efficacy. Students' beliefs about self-efficacy are most likely shaped before, during and after the specific outcome intended by the student and teacher. The shaping of self-efficacy is one aspect that I will discuss in the areas for future research section. Students bring in an array of strategies and self-efficacy beliefs into the classroom. These strategies may not be refined or even considered; as a teacher I need to support all students in choosing the specific strategies that work well for them and also scaffold specific strategies in the classroom to give them an array of strategic options. Therefore, teacher refinement through formative assessment of these strategies based on where students are at academically and with their personal self-regulating strategies is important to increase student self-efficacy and conceptual understanding.

Within the context of the research that I analyzed, two of the studies specifically implemented formative practices to see how the self-regulating strategy supported the academic outcomes, conceptual understanding and attainment of specific goals. Zimmerman et al., (1992) used goal setting as a self-regulating strategy and also measured the effect of student self-efficacy on the type of goals a student would create. Zimmerman et al. (1992), Pape et al. (2003) and DiBenedetto & Benbenutty (2013) discussed the connection between the ability to self-regulate, self-efficacy, and academic understanding and outcomes. From a different perspective, many of the articles I analyzed discussed the importance of having a community and student-centered classroom where genuine tasks are implemented and supported in order for students to attain positive academic outcomes and increased conceptual understanding (Granger et al., 2012; Pape et al., 2003).

Specific next steps for investigation include researching the questions that arose from my summary findings and insights. Based on my summary and analysis of the five studies, a few key points have arisen including: specific effects of teacher self-efficacy on the outcomes for students and if teacher self-efficacy affects student self-efficacy; the shaping of self-efficacy and the influence of internal and external factors; the effect normalized gender roles have on self-efficacy and the implications this potentially has on science conceptual understanding; and how to create a classroom that establishes, increases and strengthens self-efficacy.

The idea around self-efficacy and the effect that this concept can have on student understanding and regulating strategies is one that I want to have a better understanding of in order to inform my teaching practice. A number of the studies that I looked at discussed distinct relationships between self-efficacy and academic outcomes tied with regulating strategies. Many articles were lacking attempts to explain in what affected students' self-efficacy and how to improve it once it has decreased. I am hoping to implement specific self-regulating strategies (self-reflection, goal setting, and strategy use) within my classroom in my spring student teaching placement, with the intention of improving students' self-efficacy and science understanding. Students would receive a tool that they will be able to write or draw their strategies and reflect on how those strategies supported or did not support their intended academic outcomes. I will implement a general tool to be used each week and a tool used specifically for test or project preparation. In order to increase self-efficacy within the classroom, I will promote more choice within the classroom and set up specific tasks to discuss personal self-efficacy and why it was designed in that way. I also need to refine my research in how to strengthen self-efficacy within a classroom setting. For my research I would use key words including, *strategies to increase self-efficacy, self-efficacy formation and classroom empowerment*. The reasoning behind using classroom empowerment in

particular is that it could help me to better understand the connection between that and self-efficacy. If a student feels empowered with science and in the classroom, will that booster their self-efficacy?

My goal is to unearth what students' specific self-efficacy beliefs are in science, better understand how and why those beliefs may shape students' academic outcomes and conceptual understanding, and what will influence changes to their self-efficacy in order to know how I can positively impact their efficacy. In order to understand the root of the issue, questions for future consideration include: Was there someone in their past who discouraged students from liking science? Have they had other negative science experiences? What are strategies that I can implement to increase their self-efficacy? How can building a community classroom around self-regulation, formative assessment and student interdependency promote self-efficacy?

## **Summary and Conclusions**

As a group we asked: What are effective planning strategies to improve assessments with the goal of supporting students to become self-regulated learners? Each of us was able to answer different aspects of this question.

When considering the first section of the paper, *An Overview of Various Planning Strategies relating to Self-Directed Learning and Self-Regulated Learning*, and its discussion of the strategies, tied to assessment and feedback, that teachers should use to foster Self-Regulated Learning (SRL) we find several strategies that help to develop SRL and SDL strategies in students. These strategies included: aligning a classroom learning environment to SRL readiness (Dyanan, Cate & Rhee, 2008 p.98), aligning assessments to allow for SRL strategy use (Davis & Neitzel, 2011; Wiggins, 1998; Loyens, Magda & Rikers, 2008; Brookhart et al., 2004; Gibbons, 2002; Sendziuk, 2010), and using rubrics as well as educative assessments (either formative or summative) to develop SRL strategies in students (Wiggins, 1998; Loyens, Magda & Rikers, 2008; Brookhart et al., 2004; Gibbons, 2002; Sendziuk, 2010; Brookhart, 2008; Randall & Zundel, 2012). This also includes the use of feedback, since an adjustment toward educative assessments will require students to use feedback. This means that teachers should focus on writing appropriate and effective feedback as described by Clark (2012), Brookhart (2008) and Randall & Zundel (2012).

Within the second section, *The Use of Criteria and Feedback in Educative Assessments*, the author explored the aspects of criteria and feedback that support elementary students' conceptual understandings and what qualities of criteria and feedback help them to accurately gauge their progress within a task. It is important to consider and plan for how to utilize feedback and be aware of potential disconnect between the intentions behind feedback and its practical application for students (Orsmond & Merry, 2011). Also important to consider is the different uses for different types of feedback (individual written feedback, individual oral feedback, and group oral feedback) and how they can have a combined effect of increasing student's content understanding in addition to helping teachers see where to scaffold tasks (Randall & Zundel, 2012). Criteria that are offered in a *feed forward* way can help students understand content and later feedback. Much of the research examined in this section speaks to the need for explicitly teaching the use self-assessment in order to aid students' understanding in how to apply feedback (Randall & Zundel, 2012). In addition, the use of exemplars as a tool for increasing students' understanding of a task and their progress in attaining the expectations for a task is a beneficial practice worthy of experimentation in the classroom (Orsmond et al., 2002).

When considering the third section, *Self-regulated Learning Development and its Effect on Self-efficacy and Conceptual Understanding in Science*, it is important for teachers to support students in using self-regulating strategies to promote increased self-efficacy while implementing effective educative assessments (Bell & Cowie, 2001; Pape et al., 2003). One of the main insights that researchers discussed was how important it was for students to be involved in their learning process and attribute specific learning outcomes with their strategic behavior and self-regulating strategies (Granger et al., 2012; Pape et al., 2003). Increased self-efficacy beliefs can be attributed to higher goal setting as well as a form of accountability and motivation for students to attain those goals (Zimmerman, Bandura & Martinez Pons, 1992). Goal setting and self-reflection in general will most likely lead to increased understanding of the content that is established (Brookhart et al., 2004). Pape et al. (2003) discussed the relationship between forming a community classroom where value is placed upon self-regulating strategies in order to promote conceptual understanding.

From these key insights we noticed several themes develop through our research. One of the most repeated themes is the idea of alignment. These themes take multiple forms ranging from: aligning classroom environment to student readiness, aligning the classroom environment to value *SRL* strategies in a student centered way, aligning feedback given to students, aligning assessments to their purpose and audience or aligning assessments to allow for *SRL* strategy use. Each of these has an impact on a student's ability to learn and use *SRL* and *SDL* strategies. If students are going to be able to use *SRL* strategies, the class needs to be set up in ways that support the use and development of those strategies. Some of the *SRL* strategies students may need to develop include: self-assessment, self-evaluation, and self-reflection, self-correction, seeking external support, goal setting, self-monitoring, and the ability to utilize feedback. These strategies and the work done to develop them also have noticeable benefits for students when it comes to externally-mandated assessments (William, Lee, Harrison & Black, 2004).

Another theme we noticed was the degree to which teachers influenced the ability for students to use *SRL* strategies. This can be seen through their impact on the prior mentioned alignments as well as on feedback and grading. Since each of the alignments is in part controlled by the teacher the considerations for those alignments needs to be looked at in a reflective light. This can be thought of in terms of a teacher's understanding of the theories of assessment (Davis & Neitzel, 2011) or the refinement of the assessment tool used based on student responses (Pape et al., 2003). The use of *SRL* strategies by the student is also impacted by the self-efficacy of the teacher and whether or not the classroom environment has been established to value *Self-Regulated Learning* (Granger et al., 2012).

The knowledge that we have gained from the articles and studies examined has allowed us to see ways refine our practice in order to better support our students. The insights gained from our research will support us in developing practices tied to educative assessment including the effective formation and use of feedback and implementation and tracking of self-regulating strategies. Developing and nurturing a learner-centered classroom environment promotes self-regulated learning. The information that was gained through this research will help us work towards a more collaborative, complex and inclusive classroom for both teachers and students. It also could lead to a new method for differentiation in our classrooms. As we move forward we will take our research with educative assessments, self-regulation, and feedback and start implementing strategies into our practice as professional educators. The overall goals of educative assessments and the implementation of *SRL* strategies are compatible with our desire as professional educators to assist students in developing and using the tools and skills that will support their individual learning within specific content areas and, further, that will empower them as life-long learners.

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# Utilizing Assessments to Inform Differentiation Decisions

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This literature review of 20 articles is an effort to respond to the question, “*What are strategies for utilizing assessments, in order to appropriately differentiate in ways that will guide students toward attainment of learning goals?*” We also had individual questions: “What formative assessment strategies can be used to identify student learning for the purpose of informing curriculum planning and guiding instruction?”, “What are effective strategies for giving appropriate feedback to students after assessments to increase learning in a differentiated classroom?” and “How can assessment be used in order to get to know students as individual learners?” The articles were found using Ebscohost and Jstor. Differentiated instruction involves teachers adjusting “curriculum, materials, and support to ensure that each student has equity of access to high-quality learning” (Tomlinson, Brighton, Hertberg, Callahan, Moon, Brimijoin, Conover & Reynolds, 2003, p. 120). Formative assessments should be designed to allow individual students to demonstrate their understanding and to improve classroom instruction overall. From our research, we concluded: formative assessment strategies can be used as effective diagnostic tools, for both the student and the teacher, to create a student-centered learning environment; feedback should be understandable with time dedicated to students being able to review and process the feedback to correct misconceptions; and data should be viewed through a broad lens and collected through a variety of avenues. Our findings create a platform for our further learning regarding the development of differentiated instruction including: how to assess, use feedback and utilize data.

**Keywords:** Differentiated instruction; feedback; data collection; formative assessment; diagnostic tool; alternative assessment; learner variance.

This paper addresses the question: *What are strategies for utilizing assessments, in order to appropriately differentiate in ways that will guide students toward attainment of learning goals?* Our goal, as teachers, is to meet the needs of each student in our classroom, so that all students can be successful. Differentiated instruction is a broad topic and, as a result, we found we needed to be more specific in our investigation. Assessments are tools for teachers to be able to diagnose the learning needs of students. They provide a way for the teacher to make informed decisions about developing differentiated instruction.

What would a classroom look like if each student with different learning needs was given the tools he or she needed to achieve the learning goals? The teacher in this classroom knows how to capitalize on the student’s strengths to create targeted learning opportunities. Consider how learning could

transform a child when the teacher utilizes an ongoing diagnostic process of assessment to intentionally construct learning opportunities. In contrast to the “one-size-fits-all” methodology of teaching, this constructivist view of teaching and learning creates an environment in which the learner is at the center. Weber (2013), among other educational reform researchers, believed there was a great need for teachers to employ strategies that laid the groundwork for all students to learn.

There is a national debate about American students failing to meet graduation requirements and more importantly, not being equipped with the skills necessary to function after graduation (Rose, 2006). In order to combat the criticism and the failings of the educational system, teachers could be encouraged to embrace change. Differentiated instruction based on assessment could be one way for teachers to see every student has access to academic success. Through differentiation, students will feel instruction is relevant and challenging and they will be more inclined to engage in the work of the classroom (Yair, 2000).

Differentiated instruction refers to the use of strategies for personalizing instruction for individual students in the classroom (Weber, 2013). Differentiated instruction as defined by Young (2006) requires teachers to organize lessons that focus on students’ needs through individual and small-group learning activities. In other words, differentiated instruction is learner-centered as opposed to teacher-centered instruction. Instruction becomes learner-centered when activities (including instruction, activities and assessment) are designed to respond to students’ interests, learning styles and abilities.

Student engagement is critical to learning in every classroom. As Yair (2000) found, “To learn, students have to pay attention to whatever transpires in instructional moments” (p. 248). While this sounds like an obvious conclusion, in his survey of 12 research sites encompassing 33 schools between kindergarten and twelfth grade, he found the teacher-centered instructional method of lecturing to be the strategy most commonly used by teachers. Lectures become a problem when they are the only means for transmitting information as opposed to inviting students to interact with new information. Yair went on to state; students’ lack of engagement with new learning has the unintentional consequence of reproducing social inequality. His survey found minority and other at-risk students are far more likely to self-report a lack of engagement with the learning in the classroom when lecture style teaching is used. The effect on these students is severe because social inequality is then perpetuated. Differentiated instruction based on assessment has the potential to improve student engagement because instruction is then tailored to students’ interests, needs and talents.

Assessment can be a critical piece of differentiated instruction. The data collected from formative and summative assessments can drive the decision making of the teacher in a differentiated classroom. One way student needs can be diagnosed is through a variety of assessments in the classroom. Weber (2013) stated, “without pre-assessment there can be no significant differentiation” (p. 182). Recent literature suggested that teachers and administrators viewed assessment as an effective method to gather information on student understanding of content. Young (2006) looked at what data is, specifically from a teacher’s standpoint, and how the organization of data was often challenging for teachers. In order for formative assessments to be meaningful, teachers need to analyze data to inform their instruction. Young conjectured, “The policy logic of using data for instruction further assumes that teachers and schools analyze assessment results to investigate their instructional practice” (p. 522). An assumption is made that teachers are willing and open to scrutinizing their practice and making modifications for the benefit of individual students.

Self-assessment by students is also a part of differentiated instruction that is not commonly included in many traditional classrooms (D’Souza, 2011; Torrance & Pryor, 2001; Offerdahl & Tomanek,

2011; Pedrosa de Jesus & Moreira, 2009; Waters, Smeaton, & Burns, 2004). Student self-assessment gives students a sense of control and choice in the classroom. When students feel they have some control and choice in their own learning, it increases their motivation to learn (Brookhart, 2008). If students are given the opportunity to reflect on their learning and be metacognitive about the strategies they are using, a pathway is opened up for teachers to give students feedback on their learning in an assessment conversation. Brookhart found that the learning pathway is made even better when students are required to look closely at their performance while also keeping their personal desired performance level at the forefront.

Adding teacher feedback gives depth to the student's learning cycle. Brookhart (2008) stated, "Good feedback gives students information they need so they can understand where they are in their learning and what to do next - the cognitive factor. Once they understand what to do and why, most students develop a feeling that they have control over their own learning - the motivational factor" (p. 2). When tailoring learning to the needs of individual students, teachers need to know feedback comes in many forms and not all feedback is useful to students' achieving the learning goals in the classroom (Walker, 2009). A study investigated students' and teachers' perception and use of feedback in the classroom found feedback centered around behavior to be the primary form used by teachers (Burnett & Mandel, 2010). This was an interesting finding because when teachers were interviewed, the majority believed they used ability and effort feedback as opposed to behavior feedback. There might be a disconnection between teachers' understanding of feedback and their actual use of feedback in the classroom. In order for differentiation to be effective, teachers need to understand feedback should be personal, goal oriented, and individualized (Burnett & Mandel, 2010).

With all of the beneficial aspects to differentiated instruction there appears to be a lack of full participation by the teaching community. In our research we found one of the reasons differentiated instruction is not happening is a perceived lack of time. Tomlinson, et al., (2003) said that teachers feel the pressure of much to do and little time in which to accomplish it. She added, "appropriate response to learner variance is also impeded by instruction in which understanding is sacrificed to coverage and where teachers have not identified key concepts, ideas, and skills that would serve as a solid framework for modifications" (Tomlinson, et al., p. 122). In other words, time constraints are often barriers to educators' implementation of differentiated instruction.

After following teams of teachers in different schools and districts, Young (2006) reported some teachers' valued making instructional changes, but were resistant because they lacked the skill to connect the data to content, curriculum, and instruction. Specifically, Young stated some teachers lacked quantitative skills or were not proficient in using computerized systems to effectively track incoming student information. Possibly, her most important finding was that data collection among teachers was more likely to be used in meaningful ways and perceived as useful to the teachers when the leadership also supported it. One way this can be done is for administrators to set aside time for data analysis and discussion of instructional implications in a collaborative environment.

Resistance to implementing differentiated instruction through alternative assessment strategies is caused by several contextual components. Tomlinson, et al., (2003) speculated "They feel doing so calls attention to student differences; they feel it is not their job to do so; they are unaware of learner needs; they believe special treatment is poor preparation for a tough world that does not provide special treatment" (p. 122). In other words, resistance to the implementation of differentiated instruction is within teachers' mindsets about individualized instruction. Misconceptions about differentiated instruction were, "the idea that it requires a separate lesson plan for each student, that it is only for special education

students, and that it is far too complicated and challenging for implementation in a general education setting” (Weber, 2013, p. 181). There appears to be a lack of confidence in teachers’ own pedagogical competency.

Despite the barriers and points of resistance to differentiated instruction, the literature and studies showed the need for individualized instructional practices (McMunn & Butler, 2011; Moon, 2005; Tomlinson, et al., 2003; Weber, 2013). The three main elements of assessment as it relates to differentiation that we will focus on in our paper are assessment, feedback and use of assessment in building teachers’ knowledge of students.

We encountered many action research projects and quantitative experiments in our research. Action research usually involves small, convenient sampling due to the limited resources of the classroom teacher conducting the research. While this may limit a certain amount of the transferability, we feel strongly these studies are worth time and attention because action research is driven by a desire to improve educational practice. Another limitation of the action research we reviewed is the difficulty of knowing whether the highlighted strategy within the study is solely responsible for the improvement in student performance because there were no comparison groups included. Along those same lines, quantitative experiments limit the kinds of conclusions that can be drawn. Experiments focus on strictly defined variables and do not describe all that is happening in the classroom that may have contributed to the observed outcome.

## **Formative Assessment as a Diagnostic Tool**

*by Kelly Lovall-Jones*

This section of the paper explores what formative assessment strategies can be used to identify student learning for the purpose of informing curriculum planning and guiding instruction? In the following research cases, the findings point to the benefits of assessing students’ ongoing understanding. Formative assessment is seen as one of the more valuable tools a teacher has to judge if her students are learning and if her teaching strategies are working (D’Souza, 2011; Torrance & Pryor, 2001; Offerdahl & Tomanek, 2011; Pedrosa de Jesus & Moreira, 2009; Waters, Smeaton et al., 2004). Compared to traditional, or summative, assessments in which multiple choice, matching, short answer, and fill in the blank tests are given to measure what students have learned at the end of a lesson or unit, the alternative assessment, or formative assessment, approach to learning evaluates where the students are in their learning as a way to inform further curriculum and instruction. J.L. Herman (2010) described the difference in assessment from a formative perspective as opposed to that of a summative, “Rather than focusing backward on what has been learned, formative assessment helps chart the learning road forward, by identifying and providing information to fill any gaps between the learner’s current status and goals for learning” (p. 510).

In my classroom experience I observed some lessons that were effective while others were not. When I gave my summative assessments I was not always able to account for the different levels of student performance. This research study emerged from my desire to find more effective methods for gathering information of student learning so that I could, in turn, create a better informed curriculum and instruction. In my search for formative assessment strategies I found that differentiated instruction was frequently used to better meet the needs of children in the classroom. Students learn through direct instruction, group work, and independent study, but at different times and in different situations; some

students grasp the course materials quickly while others need more time to process; and some students require less one-on-one support, whereas others need more hands on guidance. It is because of these differences in learning needs that I see the value of developing a variety of differentiated instructional strategies. In order to meet each student's learning needs we must escape the notion that our classrooms are homogenous. Each child requires a variance or differentiated instructional approach in order to learn. Assessments should be a formative tool that enables teachers to diagnose student learning so that they are able to plan curriculum, adjust instruction, and generate summative assessments that more accurately measure student learning; they should not be limited to a measurement of what a student has learned after it's too late to do anything about it (Tomlinson, et al., 2010).

In searching for relevant studies in the educational community to further my investigation of formative assessment types, I used the search engine Jstor and ERIC. I used variations of key terms for formative assessments to find academically relevant and peer reviewed studies published within the past 20 years. The following terms were used in my search: "alternative assessments," "formative assessment," "assessment for differentiated instruction," and "differentiated assessment types." The results of this search led to case studies that describe the impact of formative assessments on students' understanding and teachers' overall practice.

The research that I discuss in this section is taken from five research studies that are primarily action research in nature. In each of these case studies formative assessment strategies were introduced into the classroom as new alternative assessment methods. Most educators in these studies saw the benefits that formative assessment had on student learning (K'Souza, 2011; Torrance & Pryor, 2001; Offerdahl & Tomanek, 2011; Pedrosa de Jesus & Moreira, 2009; Waters, Smeaton et al., 2004). Many said that they already used formative assessment methods. They just did not necessarily use the information they gathered to differentiate or alter their instruction. Both teachers and students responded well to the new strategies. The majority of students preferred using alternative assessments and many of the teachers not only adopted the new strategy into their instructional practice, but they also found ways to extend it in their teaching.

The purpose of this section of the paper is to investigate and identify the most effective types of formative assessment and how the information gathered from these assessment practices can be used to alter instruction. In the following case studies many of the same themes emerged when the participating teachers used the new assessment strategies. The participating teachers all used formative assessment as a reflection tool, a tool for creating student, teacher communication, a tool to teach and assess the type of student thinking, and as a tool to promote students' self-assessment skills.

**Assessing student learning through guided inquiry.** Taken from a larger study in which the researchers sought to understand the process in which teachers learn to teach, D'Souza (2012) was concerned with how a beginning teacher changed her assessment practices through a span of five years. D'Souza used this longitudinal case study to look at how a teacher working in a low performing, non-collaborative, urban high school constructs, understands, implements, and revises assessments when using a guided inquiry system to analyze student work samples. D'Souza used the constructivist-orientated theories of learning which suggest that formative assessment is "a process that occurs over time and includes inquiry into practice and the examination of pupil work as feedback for instruction" (Black & William, 1998; Cowie & Bell, 1999; Fluckiger et al., 2010; Lee & William, 2003; as cited in D'Souza, 2012, p. 79), as the stepping stone for this study. The purpose was to see how the teacher's set of beliefs and values about instructional practices shape how students learn, and how a teacher's self-reflective feedback is used as a formative assessment strategy. The findings implied that using guided reflection

practices when assessing student work could be beneficial in forming teachers' beliefs and directing teachers' practice.

In this qualitative case study the author gathered data through nine detailed interviews conducted over a span of five years. The teacher was asked to bring examples of student work to these interviews, and was then asked to answer the Teacher Assessment/Pupil Learning Protocol (TAPL) questions in a "talk-aloud" protocol format. Then the researcher looked for how patterns and themes regarding student learning and assessment intersect (D'Souza, 2012). Next, interview transcripts were coded. The data was read chronologically and in reverse chronological order, for question types, and for responses to contextual circumstances (e.g. intention, assessment strategy, assessment type, and etc.). Three student learning and assessment-based categories emerged from the coding: beliefs about assessment, use of rubrics, and responsibility for learning (e.g. student effort, self-assessment etc.).

This study was conducted over a prolonged engagement of five years, which may have been sufficient time to gather data, establish patterns, and connect themes. However, because there were only two interviews per year the researcher may not have been persistently engaged; and this may have had an effect on the interpretation of the participating teacher's developing beliefs. The author used clear and detailed thick description of the context of the school and the environmental factors that contributed to the purposeful sampling of this teacher. This detail might help to inform readers of what classroom context the practice of guided inquiry reflection can be transferred. Lastly, the variety of triangulation of data collection in the form of interviews, questionnaires, student work examples, and observations gave a broader view into the nature of student learning and changing assessment practices. The data and interpretation in this study is confirmable. The TAPL questions and the transcribed interview responses to these questions can be traced, and the process of analysis and interpretation was made visible.

Through five years of teaching, including one year of student teaching, this teacher's use of a guided inquiry practice to reflect on how and why she created assessments changed over time. Her practices were more narrowly focused during her student teaching as she assigned mini-lessons and spent her time working more one-on-one with students who struggled (D'Souza, 2012). As she used the guided inquiry questions to reflect on her assessment strategies she began to see the benefits of using rubrics and setting broader goals for her students to better help them become more reflective and independent learners.

Her beliefs in the use of rubrics as a tool for formative assessment flip-flopped over time. During student teaching she lacked confidence in grading and used rubrics as a validation tool for administrators, students, and parents. In her first year of teaching she began to think of them as a formative tool to help guide student work, but by her second year she went back to thinking of them as a way to hold teachers accountable, and not as a particularly useful tool in directing and assessing student learning. It wasn't until her third year when she started teaching an AP class that she began to revisit the way she looked at rubrics and their purpose. In preparing for her AP class she connected with teachers online. They offered a variety of resources including a more effective, non-numbered rubric system that provided clear direction for student improvement. Throughout these five years of inquiry-guided reflection, this teacher developed strong approaches to the development of learning goals, a more effective rubric system, and ways to implement long-term planning.

The guided inquiry protocol in which the author engaged the teacher can be a useful tool. This reflective practice enabled the participating teacher to think about ways to construct, understand, implement, and revise assessments. This strategy relates to my research in finding formative assessment strategies that will help me differentiate instruction. It's the guided questions that direct how the teacher

reflected. D'Souza (2011) believed "The process of analyzing student work samples facilitates the exploration of formative assessment as a tool for improving both learning and subsequent teaching" (p. 79). Because the goal of my research is to find formative assessment strategies that I can use to inform my instructional choices, this study made me think about the ways in which reflection, guided by inquiry questions, can help translate assessment information into a plan of action. The participating teacher began to use it for more than just an assessment self-reflection tool; she began to see ways in which it could be implemented as a tool to teach students self-reflection in their own learning. Her reflections also led her to consider making specific goals for assessments while planning her units backwards, so that each assessment was more effectively aimed at attaining the learning targets. The teacher concluded, after reflective inquiry, that she could broaden her students learning by making long term learning objectives to better prepare her students for college. She believed she could do this by changing the practice of mini-lessons, in which her students worked individually and were completely dependent on her at each stage, to a more interdependent strategy in which she guided them to become more reflective and engaged in the practice of group work.

Because this study is limited to only one teacher who is described as an "exceptionally organized and highly motivated teacher" (D'Souza, 2011, p. 82), I believe that in order to gain a clearer perspective of how to use an inquiry approach to guide my practices, I will need to further research the ways in which teachers' thinking leads to their assessments choices. For now, however, I may be able to transfer this strategy to my own practices as an English Language Arts teacher. This metacognitive approach is one that I wish to use in formulating my assessments; and the findings in this study were particularly useful to this practice because they employed an inquiry questionnaire strategy that guided reflective thinking.

**Developing formative assessment in the classroom.** Two university-based researchers and a team of practicing teachers combined forces to conduct this qualitative action research study. The authors, Torrance & Pryor (2001), wanted to actively build and expand on research that had previously been conducted; they wanted to investigate the practical ways their findings could be applied to a naturalistic classroom setting. The two researchers and 11 practicing teachers collaborated and formed a two phase strategy. In the first phase they used reflective practices to develop a framework for formative assessments. In the second phase the teachers used the formative assessment framework to enact changes in assessment and instructional practices. The findings showed that teachers' knowledge of convergent and divergent forms of assessment and the distinction between them, in conjunction with the teacher's self-reflection, gave them the tools they needed to implement strategies and approaches to formative assessment.

Based on their prior research, the university-based researchers came up with a model for assessment which offers a description of convergent and divergent assessment practices. Convergent assessments aimed to discover *if* the learner knows, understands, or can complete a predetermined task; in contrast, divergent assessments aim to discover what the learner knows, understands or can do (Torrance & Pryor, 2001). The model gives detailed lists of what the differences between the two look like in classroom practice.

In the first phase of this action research, the authors and the participating teachers used the previous research as a reflective tool during interviews, when reviewing video and audio recordings of the teachers working with students, when analyzing student work samples, and when exploring the practices and pedagogical beliefs of the teachers. The goal of this collaboration was to create an "analytic framework" that the teachers could use as a formative assessment tool during instruction. In the second phase, the teachers put this "analytic framework" into practice in their classrooms.

The findings showed that formative assessment strategies, developed by the participating teachers and researchers, changed the teachers' classroom practices—specifically in how they clarified and communicated assessment information to their students. Once the teachers reviewed the lists of convergent/divergent assessment differences and compared them to their own practices, they concluded that they had mostly been conducting convergent or summative assessments, which were characterized by the following: Precise planning and an intention to stick to it, tick lists and can do statements, an analysis of the interaction of the learner and the curriculum from the point of view of the curriculum, closed or pseudo-open questioning and tasks, a focus on contrasting errors with correct responses, judgmental or quantitative evaluation, and involvement of the student as recipient of assessments. (Torrance & Pryor, 2001, p. 617) They were not using the divergent or formative assessment practice: Flexible planning or complex planning which incorporates alternatives, open forms of recording (narrative, quotations etc.), an analysis of the interaction of the learner and the curriculum from the point of view both of the learner and of the curriculum, open questioning and tasks, a focus on miscues-aspects of learner's work which yield insights into their current understanding, and on prompting metacognition, involvement of the student as initiator of assessments as well as recipient. (Torrance & Pryor, 2001, p. 617)

When looking at the video recordings of their classroom practices and comparing them with the convergent/divergent model of assessment, the teachers decided they needed to be more explicit with their students. The formative assessment framework that they developed became a continuously revolving and interactive communication cycle where the teacher communicated the tasks and quality criteria, used questions (helping as well as testing questions), conducted observations of student process and products, and offered feedback with little judgment (Torrance & Pryor, 2001). The results were encouraging. Both the teachers and the students responded well to the changes as reflected in the teacher's increased use of student/teacher communications. The teachers started to communicate the learning goals and the quality criteria (rubrics); and in an effort to formatively assess their students, they started asking open-ended and probing questions to gauge understanding, they observed students at work and combined these observations with feedback. As a result the students were more focused on their learning goal, better able to self-assess the progression of their learning, and more comfortable communicating their thinking to their teachers.

In phase one, findings showed that teachers began with a narrow view of what constituted assessment and what their role was in it. It remained unclear to teachers how to use the data from assessments to plan instruction. Yet in the second phase, the teachers were able to use the reflections of their teaching in partnership with the formative assessment and analytical framework to adjust their instructional approaches.

Adjustments in how the teachers communicated the learning goals and criteria to their students, and the process in which they questioned, observed, and offered feedback evolved into an interactive dialogue between teacher and student. This dialogue was structured and focused toward the learning goals, and because the dialogue was interactive, it was an effective way for the teacher to assess student learning.

The strength of the findings is a result of the prolonged engagement in which the researchers observed and collaborated with teachers. They met 17 times over a period of two 7 month cycles. During this time they shared and discussed their analysis, data, and methodology of classroom formative assessments. The triangulated data helped broaden the scope of this action research and highlighted a self-reflective process that the teachers could use to alter their assessment practices. The authors used convenient sampling by sending out an open-invitation flyer to a local educational authority inviting any educator who was interested in the study to apply. The only requirements were that the teachers must be

interested and that their leadership must be supportive. Because this sampling probably attracted educators who were willing to commit time and energy to a study which may or may not have improved their practice, it can be inferred that the teachers took the study seriously and attempted to adopt the mandated strategies.

The interactive nature of the university-based researchers and the teacher-researchers adds credibility to the findings. The member checks and peer debriefing practices of the research team not only offered them a valuable opportunity to reflect on teacher assessment data, but it also opened the door for interactive collaboration. This collaboration allowed the teachers to help design practical strategies for implementing the convergent/divergent assessment model into a workable classroom practice. During half and full day meetings, the teachers discussed their practices, logic, progress, data, and findings as they worked with researchers in the generative process. This persistent engagement also offered useful insight into how valuable it is for a teacher to be self-reflective.

In this study the authors outlined applicable ways to use formative assessment as a classroom management tool. First, they took into consideration the social approach to the classroom procedures when implementing student-teacher communication. They communicated to students not only what the task requirements were, but also what a quality task looked like. Then they asked substantive questions that elicited further student thinking and planning. Written and oral feedback was also given during the process to help guide and focus student work. In an English language arts classroom this process of formative assessment in communication compliments the language skills that are part of the content curriculum. By using communication strategies I can model effective communication skills to my students.

Another way this study spoke to my interest in formative assessment is in the self-reflective practices used by the teachers. The findings suggested that the process of formative assessment is useful if teachers use it to rethink and adjust their practices. Formative assessments are tools that teachers can use to diagnose student learning, and because each child is different, the nature of the tool that a teacher uses to gauge student learning will most likely change. What works for one student may not be an appropriate option for another student. This study now makes me think about how I might use reflection to guide my assessment choices. The author outlined ways to better help me think about how I might adapt my strategies and differentiate my instruction. Also, the analytic framework adapted from the convergent/divergent model outlined a useful practice to formatively assess students. I can see some very applicable ways in which this reactive and responsive framework might serve to strengthen the learning community in my classroom. It will create an inviting and continued dialogue between me and my students (Torrance & Pryor, 2001).

**Changes in instructors' assessment thinking related to experimentation with new strategies.** In this case study, Offerdahl and Tomanek (2011) were concerned with how teachers think about assessment. They used some of the more prominent sociocultural perspectives on learning and teaching to explore the nature of assessment, in particular, how assessment can be used as a tool for learning and not just as a tool for measuring what has been learned. Because their goal was to find out how teachers think about assessment, they introduced two formative assessment strategies to three teachers. They then observed these changes in instructional practice to understand the nature of teachers' assessment thinking, the ways in which teachers' thinking develops after using alternative assessment strategies, and the impact of revised assessment thinking on assessment practices in the classroom. They found that the teachers saw these new formative assessment strategies beneficial for diagnosing student learning, informing their development of summative assessments, and as a supplement to lectures.

This qualitative case study was conducted at a postsecondary school. It followed three science instructors who implemented two alternative assessment strategies into their instructional practice. Two semesters were spent examining the inter-relationship between the instructors' thinking and their practice as they made use of these formative assessments. The first strategy was an electronic response system (called clickers). The instructors used these clickers to pose pre-determined questions to their students on a PowerPoint midway through the class. The students were then supposed to respond to the questions using the clicker system. The results would then be tallied by the computer and would allow the instructors to assess their learning during class. The second formative assessment strategy that they used was student generated reading questions. The students were expected to post questions online from the previous night's reading. The instructors would then be able to gauge student thinking and use their clicker questions to direct instruction for class the next day. The goals of these two alternative assessment strategies were to collect data that would reveal student thinking and to increase student engagement (Offerdahl & Tomanek, 2011).

The researchers used an interpretive data reduction process was used to analyze student responses to instructor questions and instructor responses to student reading questions. This approach was used to both reduce and triangulate the data in order to identify and validate emerging themes and patterns (Offerdahl & Tomanek, 2011). Analysis was done by reading and rereading text, underlining sections of text, and noting emerging patterns with reference to the research questions. These patterns were then discussed by the researchers and either supported or contested (Offerdahl & Tomanek, 2011).

The researchers began by looking at the teachers' beginning beliefs about assessment. They used these responses and compared them to changes in the teachers' beliefs after implementing the new strategies. These teachers started out thinking of assessment as a summative tool with which they used to determine how to assign grades on exams. They also thought of it as a "measure of student achievement and a mechanism by which judgments could be made about student learning after instruction had taken place" (Offerdahl & Tomanek, 2011, p. 787). But after using student questions and clicker responses they began to see the benefits of these new strategies as diagnostic tools that informed them of areas where students excelled and struggled. They also used these strategies as a teacher feedback tool. Each instructor spent between 10-20 hours per week responding with feedback to student questions. One of the teachers even extended the scope of how feedback could be used. He began to see the potential for students to use it as a way to self-assess and engage in feedback with each other. He envisioned an online forum in which students pose questions and responded with feedback to each other's questions.

There were many components in this study that make it credible. For example, the researchers triangulated data. They gathered reflective journals, field notes, and course documents with recordings of the teachers' assessment thinking during their experimentation with the new strategies. Lecture notes, exams, quizzes and problem sets were also collected to serve as additional evidence of assessment. In addition, the researchers conducted six interviews with each teacher, which lasted between 30-60 minutes and were audio-taped and transcribed. The researchers' prolonged engagement of one year gave them sufficient time to observe and collect detailed data. Because the first author attended these classes daily, her persistent observational practice was useful in collecting, analyzing, and synthesizing data to establish patterns.

The observations were subjective given the fact that one of the authors of this study was also a student teacher in the research classroom and worked very closely with the instructors. However, because there were two researchers in this study, there were multiple perspectives that worked to identify any bias that may have existed. Both authors peer debriefed in weekly meetings. This allowed them to discuss,

verify, and revise findings from emerging themes. The authors also conducted member checks of the participant instructors. Here, they reviewed the facts presented in the study and asked the teachers to look for missing or inaccurate events.

Using quality driven, case-base questions as a formative assessment strategy may not be transferable for a K-12 general education classroom, because the thick description of the school context and the student sample focus primarily on a university science department. However, the fact that student and teacher questions have been used in other case studies and have proven to be useful as a formative assessment tool, they may have the potential to transfer to other general education classrooms.

These authors suggest an important idea. Teachers may not be inclined to change their old practice unless they are discontent with it, or if a new strategy is introduced that makes them reflect upon their old practice (Offerdahl & Tomanek, 2011). It made me see how the process of implementing new strategies should be the goal throughout teaching. In this study the use of clickers and student generated questions was a catalyst for change. This change created conversation and dialogue between the teacher and the learner. It created a platform for teacher and student feedback and helped the teachers diagnose student learning. This study reinforced my belief that. My professional development relies on my investigations into new strategies for teaching.

The process that the researchers and teachers used to elicit student questions in order to gauge student understanding connects directly to my own interests in finding formative assessment strategies. The reading questions written by the students in this study gave the instructors the information they needed to assess student understanding. They used the information they gathered to inform the way they wrote their future clicker questions. The student generated questions also prompted changes in instructional practices in the form of feedback. Here the teachers commented on the thinking students used to generate their questions. Both the clicker questions and the reading questions allowed the teachers to assess students understanding in class and during the same lesson. This was a valuable tool in gauging areas students' were clear and areas in which they were struggling. However, because there was little mentioned in how the questions were constructed or, more importantly, if a rubric was used to guide the students in creating quality questions, I found that this study provokes my curiosity to further research student generated reading questions as formative assessment tools.

**The role of students' questions in teaching, learning and assessment.** Concerned with the quality of teaching and learning in the sciences at the University of Aveiro, Portugal, Pedrosa & Moreira (2009) used this case study to explore student learning from the position of a student-centered instruction and question-based assessment curriculum. The authors wanted to look at the development of questioning competencies of science students to see if student generated questions could be used as both a teaching strategy and a formative assessment strategy. Their goal was aimed at exploring the use and integration of students' questions as an alternative form of assessment, to measure how well students articulate their questions in a problem-solving based way, and to find classifications of what constitutes quality questions asked by students. The findings showed that there were benefits to using student questioning as a formative assessment tool to improve student learning.

This is a mixed methods action research study in which the researchers investigated how students' questions changed over time. Over 200 students were observed, and 10 different students were interviewed, all with varying degrees of skill and participation. Conducted in the naturalistic setting of a university chemistry classes, the authors followed the same lecturer for one year. Each class session was directly observed. The chemistry department introduced problem-based cases as a formative and summative way to assess students' thinking. The researchers measured the students' understanding of the

content taught in the chemistry classes with the quality of questions they used to solve the problems in each case. The quality of questions used was analyzed for their level of high order thinking, as well as for their relationship and orientation to the problem presented in the case.

The researchers asked the same question to every student. There were 2,367 questions asked in all. The questions were transcribed from student written assignments, organized, and categorized within a software program. The researchers purposely chose ten students to be interviewed. They looked at the number of questions these students posed during class and during formative and summative assessments, the teacher's feedback, and their final chemistry grades as factors in the selection process.

The researchers looked at two semesters in which two formative and two summative assessments were given the first semester, and one formative and two summative assessments were given the second semester. The findings were based on the questions students asked when being assessed on problem-based cases. The researchers analyzed the frequency in which questions were asked, the cognitive level they used in asking the questions, the relationship of the questions to the problem, and the orientation of the questions to the knowledge of the discipline.

During the first semester, there was an increase in the average number of questions asked and the mean number of questions per student asked. The researchers believed that this increase might be an indicator of students' deeper engagement in the practice of posing questions (Pedrosa & Moreira, 2009).

With regards to the cognitive level, the majority of questions asked during the first and second semester were of the lower cognitive level (fact, knowledge, comprehension). The students began to ask more high cognitive level questions (application, analysis, synthesis, evaluation) during the second semester. There was an increase from 12% to 21%. The authors believed that might be an indicator of better performance on the formative assessments (Pedrosa & Moreira, 2009).

When looking at the relationship of the questions to the problem, the researchers looked for questions that did not include information provided within the problem. This means that higher cognitive levels were achieved because the student used their own skills to analyze, evaluate and synthesize the information to come up with original thinking in their questions. This type of question increased from the first semester to the second. The researchers attributed this increase to the possibility that the question guidelines were reinforced and that feedback from the teacher "emphasizing careful reading and selection of relevant information, along with the importance of formulating questions whose answers were not provided in the problem" (Pedrosa & Moreira, 2009, p. 202-203).

When measuring the orientation of the questions, the researchers were looking at the global and the general aspects of the problem to see if students would use their knowledge of the content to ask questions. During the first semester the highest number of questions was orientated toward the context of the subject, but the second semester the number of questions that had no orientation to the problem increased. The authors explained that the difference could be based on the nature of the situations found within the problem (e.g. social, political).

The empirical data showed that there was a significant positive correlation found between the following associations: the cognitive level of the questions asked and the relationship to the problem posed ( $p < 0.01$ ), the relationship with the problem and the orientation to the problem ( $p < 0.01$ ), the cognitive level and the orientation' to the problem variables ( $p < 0.01$ ).

In other words, the results showed that students who used fewer elements of the information included in the case problem asked higher cognitive thinking questions. Students who used the problem's information in their question tended to associate the question to the subject's discipline. Students'

cognitive level of question-asking was higher when they related their questions to the subject area that their problem was based.

When analyzing the frequency, cognitive level, relationship, and orientation of the student generated question as they relate to the problem posed on the assessments, there was a positive result. 70% of the students who participated were able to formulate at least one question of quality.

The authors described the sample group as university undergraduate students majoring in science or engineering. This thick description gives clues into the educational mindset of the students in the study. Certain inferences can be made into their willingness to participate and their motivation to do well in their studies. The study took a full year in which the authors followed the same teacher as he implemented the problem-based questioning strategy. They attended each class and observed the teacher using instruction to make the chemistry based problems more understandable. They also observed the instructional strategies the teacher used to help students improve their skills and write better questions. This prolonged and persistent engagement was effective in gathering additional information needed to highlight the effectiveness of student questions, and in giving a broader picture of the formative use of this assessment strategy. The dependability of the study is found by the length of time and the stability with which the results were analyzed. Over a year was spent with different students in different classes using the student generated questions. Each question was independently analyzed and classified according to the corresponding indicators for each category (Pedrosa & Moreira, 2009). These categories were validated by a group of five university teachers and two PhD students. The results of the data were made visible within the study.

The light description of the context and culture with which this study took place should be taken into consideration when deciding if problem-based questioning is transferable to middle or high school general education classrooms. Though there was a significant increase in higher cognitive questioning use in this sample group and a willingness to engage in this type of learning, there is no certain evidence to support student question strategies as a successful learning option for middle and high school students.

The authors believed that “questions can stimulate cognitive processes and reveal the thinking frameworks of the questioners, acting as diagnosis of their understanding. This way, questions can provide teachers with important evidence on learning gains and misconceptions, helping to tune teaching strategies” (Dillon & Pedrosa de Jesus, as cited in Pedrosa de Jesus & Moreira, 2009, p. 194). It is this belief that inspired me to take a closer look at this study. Although it was conducted in a science classroom using science curriculum, the idea intrigues me, and I see the potential of transferring it to an English language arts classroom. These questions can be used when investigating literature, or more pointedly, for broadening or narrowing research projects. This study mentions the teacher’s use of rubrics to both teach and assess the quality of the questions the students ask. I can see the use of rubrics as a roadmap for quality questions, and as an instructional tool that I can use to teach higher order thinking in my classroom. I can also implement the use of rubrics to guide quality questioning in formative and self-assessment practices. It would be a worthwhile venture to learn more about how to construct quality questions in the field of English language arts. I believe that further exploration into problem-based questions, with outlined descriptions of cognitive thinking as a guide, can be a useful way to better inform my instructional practice.

**Student response to differentiated, alternative assessment.** Waters, Smeaton & Burns, (2004) were concerned with the many educational reform options teachers have to sift through when deciding which new strategy to use. They wanted to investigate alternative assessments that would serve to both improve instruction and optimize student learning in a way that was more than just theory based. The

researchers believed that using action research to test an alternative form of assessment would offer a concrete example of how differentiated assessment options can engage student interest. The purpose of this study was to examine the reactions that students had to an alternative assessment model implemented by the teacher and coauthor of this study. The study determined that most students responded favorably when asked if they found this alternative assessment style preferable to more traditional, multiple choice assessments.

The researchers of this mixed methods action research study observed and surveyed 79 students in three science classes to see how they would respond to an alternative, differentiated assessment model. The teacher-researcher implemented five non-traditional assessment methods and used rubrics to evaluate their final product. The students were allowed to choose what product they wanted to work on and if they wanted to work alone or in a group. During the length of the 90 day semester, the authors also observed students as they worked on these products. These observations revealed motivational behaviors that emerged from students' participation in the assessment activities.

The teacher-researcher invited his students to choose the following types of assessment activities: board games and three dimensional models, computer presentations, web pages, brochures, newspapers, formal or creative writings, live performances, or a combination of all of these choices. The students were then given the choice to work in a small group or independently. The teacher-researcher used a rubric during the initial stage and throughout the process. He created it and then went over it thoroughly with his students to establish clarity and a basis for self-assessment before, during, and at the time of submission.

At the end of the semester, the teacher-researcher administered a forced response survey and an open-ended questionnaire. In this Likert-style survey, students were asked 24 questions in which they had to rate their responses on a five--point scale with five being "Strongly agree" and one being "Strongly disagree." Students were asked to rate how they liked or preferred multiple choice and alternative assessments.

The results of the study indicated that the majority of the students preferred this assessment model to the more traditional multiple choice assessment option. Three sets of questions were posed in which students were asked to respond: i), whether they liked or felt comfortable with assessment choice; ii), why they preferred these assessments to traditional tests; and iii), why they preferred multiple-choice tests to the alternative assessments. The results from students' responses concerning choice were significant. Students said that they preferred getting to choose their assessment type and appreciated being able to choose between working alone or in groups. However, data also showed that not all students liked or felt comfortable with the alternative assessment model and, in fact, preferred multiple choice questions. There was a large standard deviation for alternative assessments over multiple-choice tests, with clustering patterns located at opposite ends of the scale. These findings may make a case for including multiple choice options into the differentiation assessment model.

The authors also observed students while engaged in the assessment activities. Based on the high level of participation they were able to note three educational benefits to the alternative assessment model. First, the students showed a high level of enthusiasm as exhibited by the very few students who were off-task, the various talking, movement, and laughter geared toward the projects, and the fact that the overall tone was supportive. Second, there was creativity in the ways in which the students chose to demonstrate their understanding of the content. For example, students chose to design sets, create scenery, and write scripts, yet others wrote menus, performed original scripts, and presented television style weather forecasts. Third, there was an increase in the use of technology. Computers and Internet were

used to create Webpage's, presentations, conduct research, and e-mail project related information to the teacher and classmates.

The authors state that one limitation of this study is that there was no data to prove that this differentiated, alternative assessment style helped students learn more, understand the concepts better, or achieve higher grades. However, there is data to prove that student interest was present and as a result motivation increased. The researcher found that the student response to this alternative assessment model was positive. Based on the results of the question pair surveys and the classroom observations, the elements of the assessment that were most significant for students were choice, increased learning, and extended experience.

This study includes many elements that make it credible. First, the sampling was convenient as evidenced by the author's dual role of teacher in the classes the study was conducted. The convenience of his sampling adds strength to his finding because of the persistent observations he was able to make over time. Also, the fact that he conducted observations over a prolonged engagement speaks to the sufficiency of involvement invested to gather changing data for the purpose of looking for emerging themes. Although there may be some question of the objectivity of the teacher-researcher to the study, given the subjective nature of the student/teacher relationship within the classroom, his process of analysis and interpretation was made visible in the study.

The transferability of this study might be in question due to the limited triangulation. The data was gathered through student questionnaire responses and class observation, but there was no data collected that would inform the reader of the culture, gender, socio-economic status, prior knowledge, or prior attitudes of the sampled students. This might inhibit the reader's ability to use the findings in the context of their classroom. Also, there is little in the form of thick description of the cultural context of the school and the surroundings to speak to the accessibility of technology in other classrooms.

The way the teacher-researcher differentiates his assessments resonates with my goal of teaching to "every" student. I find that the strategies used in this study also expand my thinking about how I might both generate and interpret formative assessment activities that are product-based and geared toward the learning goals. These activities need not only have a summative end, they can be used formatively as well. I might be able to construct formative assessments that inform me of how the students understand the content while working on these activities. In addition to the use of differentiated assessment activities, I might be able to use this study to think more about the nature of rubrics and how they can be used to help both student and teacher formatively assess the progression of the performance-based work. In my English language arts classroom, my students will consistently be navigating through words and meaning. By expecting all students to demonstrate their reading, writing, and speaking skills within the traditional essay or multiple choice test assessment format, I might be limiting their interest and access to learning.

This study made me interested in learning more about how student interest plays a part in motivating students to become more active participants in their own learning. I would like to know more about the specific learning that takes place when students are offered differentiated assessment options, and how these options can be used more for formative assessment strategies. Though there were many elements in this study that I may be able to integrate into my own practices, I believe I still need to do further research to see if other product based assessments garnered similar findings and if there were variables that might have affected the decisions made by the teacher and choices made by the students.

**Conclusion.** My search for effective types of formative assessments that serve to identify student learning and inform instructional practice turned up several useful strategies. The case studies revealed

that the process of introducing new assessment strategies for the purpose of evaluating student understanding was a catalyst for pedagogical self-reflection. The mere act of implementing a new form of alternative assessment caused the teachers to take a reflective look at how they previously administered assessments and how they measured student growth. When looking back at their previous assessment thinking, many found that they primarily used summative assessments and saw the purpose of assessment practice as a way to measure what the student knows only after it was too late to make changes. Some did not take advantage of formative assessments as a tool for assessing what students did and did not understand while they were immersed in the learning process. Some did not use this information to adjust their teaching strategies. After the introduction of the new assessment strategy, however, the participating teachers did begin to see formative assessment as a tool for creating student teacher communication and feedback, a tool to facilitate deeper thinking skills, a tool to promote students' self-assessment skills through the use of rubrics, and a tool for creating student interest and motivation by offering choice.

The changes in instructors' assessment thinking after the introduction of these new assessment strategies made me do my own reflective thinking. I began to wonder how I might employ these strategies into my own practice. After studying this body of research, I think using guided inquiry, teacher-directed helping and testing questions, student generated questions, learning goal communication, observation, feedback, rubrics, and differentiated assessment choices to teach and assess student learning are all worthwhile strategies to experiment with in my classroom. These strategies seem like valuable tools; however, the most important thing I took away from these case studies is the belief in how important it is to continually seek new instructional strategies and use self-reflective practices. It is within this intentional search that I will expand my knowledge and extend my growth as an educator.

### **Effective Strategies for Giving Appropriate Feedback** *by Krystal Smith*

This section of the paper explores the question: "What are effective strategies for giving appropriate feedback to students after assessments to increase learning in a differentiated classroom?"

My question has a strong relationship to the group question because feedback is a key component of running a successful differentiated classroom. Differentiation requires teachers to use pre, formative, and post assessments regularly to check students learning throughout the unit to make informed decisions. One way teacher help students see their areas of needed growth, is through feedback. Feedback is defined as: the teacher facilitating student understanding of potential next step by making judgments about the quality of the students work (Shirbagi & Kord, 2008). To help all students in a heterogeneous classroom teacher must take into account various strategies for giving students feedback that will lead the students to mastery of the learning goals.

During my personal practice, I found it difficult to figure out which feedback strategies were most useful for students after an assessment. I want to find ways to help students bridge the gap between their current understanding and the learning goal. In past experiences I would spend a lot of time correcting assignments to then find students making the same mistakes on the following assignment. To investigate and improve my personal practice I will be looking at a variety of factors that contribute to feedback being useful/usable for the learner: feedback methods, the timing of feedback, and the form that feedback is given. With investigating these factors I want to stay true to my values that feedback should be offered

constructively and received positively; and accomplished by suggestions or guidance for making progress (Shirbagi & Kord, 2008).

When searching through peer-reviewed articles that addressed my question, I used search terms like: *formative feedback*, *summative feedback*, *effects of feedback* and *evaluation*. From my limited search of just using articles available through the Evergreen's online database on JSTOR and EBSCO I found mostly quantitative studies that addressed my question. There are limitations to mostly reviewing quantitative studies because qualitative studies provide in-depth descriptions, which would be helpful in looking more deeply at how the researchers or teachers were giving the participants feedback, specifically to find out what phrases were used to support the students.

Feedback is complex because there are many factors that contribute to students being able to receive feedback in a way that will help the student process and improve. I've examined multiple dimensions of feedback like: timing, mode, understandability, and complexity of errors made on assessments and how these factors all contribute to the students' ability to process and make improvements in the learning goal.

**Modes of feedback: written & oral feedback.** Concerned with the lack of feedback given to students after formative assessments Shirbagi & Kord (2008) investigated the pivotal role formative feedback plays in student achievement. "Formative evaluation is used to determine whether a learner has achieved an adequate level of skill or mastery of some subject content before the opportunity to learn that subject content has passed" (pg. 4). To understand the importance of feedback, the researchers created a quantitative study to examine the effects of receiving various methods of formative feedback as opposed to receiving no formative feedback (control group) in a 5th grade science classroom. Three types of formative feedback strategies were used as independent variables: oral, written, and mixed (oral-written) feedback, to see which feedback strategy yielded the best results. The results indicated that (a) written and mixed feedback methods were more effective than oral feedback, (b) written and mixed feedback methods had the same effect on educational achievement, and (c) receiving feedback was more effective than not receiving feedback on formative assessments.

Shirbagi & Kord identified their participants by using cluster random sampling of schools in Sanandaj, Iran. For the quasi-experiment a homogeneous group of 140, 5th grade students with similar intelligence levels participated. Four teachers agreed to participate in the study and go through feedback-giving training. Each teacher used a different feedback method: (a) no feedback, (b) written feedback (c) oral feedback and (d) mixed feedback. The experiment took place over eleven weeks, all students were given the same formative assessment tests each week and the teachers would administer the same feedback method each week. At the end of the eleven weeks all students took a post assessment, which the researchers used as the dependent variable to figure out the most effective feedback strategy.

The findings indicated a significant difference between the achievements of students who received written or mixed feedback over those who only received oral feedback. There was also a significant difference between the achievements of students who received feedback over those who did not receive feedback. The researchers inferred oral feedback was not as effective because it was likely that students will forget the feedback, where written feedback was accessible at any time.

Several features of the experiment helped to support the internal validity of the study. The researcher design incorporated a control group (no feedback), and three different experimental groups. This was helpful because the researchers based the increase in students test scores off of the control group scores to determine significant difference. Any differences that might come from how teachers approached giving feedback were controlled for by the four teachers receiving training from the

researchers in the modes of feedback they were required to use. Maturation was addressed as a possible variable, which Shirbagi & Kord controlled for by having homogeneous groups of participants, these procedures allowed the researchers to rule out intelligence variances that might skew the results. The researcher's findings were predictable because other researchers were referenced in the study.

The researchers pointed out several limitations that affected the external validity of the study. The generalizability was affected by the sample size being so small, incorporating only 140 students. Besides the sample size being small the students were a homogeneous group of male students. I will be teaching female students as well as students below and above the mean, so this makes me wonder what the effects of this experiment would yield with different groups. Also there was only one teacher for each of the four experimental groups. I was able to verify that teachers were trained on which mode of feedback to give the students, but information was not provided to verify if teachers were trained on how and what to teach the students. This interfered with the internal validity of the experiment because a teacher could be better than another which would affect the posttest results. This research focused only on the modes the feedback (written, oral, and mixed), which leads me to wonder more about the content of the feedback; what specifically were the teachers saying to students? One teacher may have been better than another at giving students usable feedback.

The findings indicated students who received written feedback and/or mixed feedback outperformed students who received oral feedback. This addresses my question "What are effective strategies for giving appropriate feedback to students after assessments to increase learning in a differentiated classroom." The findings help me conclude written feedback or mixed feedback methods may be more effective strategies for giving appropriate feedback as opposed to just oral feedback. The researchers inferred oral feedback wasn't as successful as written or mixed feedback because oral feedback could be forgotten quickly after being administered, where written was accessible to students after the fact. This will help me in my practice; when thinking about which mode of feedback may be most useful for students. Another important step will be to investigate the content in the feedback, what should a teacher say or write to a student to help the student increase their learning?

**Content of feedback: right/wrong feedback.** Fazio, Huelser, Johnson, & Marsh (2010) conducted this study because they felt receiving feedback on whether one's response was correct or incorrect (right/wrong feedback) could be useful within the classroom. A previous study tested students ability to translate foreign words into English words, and the findings showed right/wrong feedback was as ineffective as giving students no feedback. Since right/wrong feedback is so widely used in the classroom, Fazio, et al. wanted to examine this topic more. They explored three different situations to test their hypothesis. I analyzed the first two experiments because they related directly to my question. In experiment 1: right/wrong feedback paired with complex content would show right/wrong feedbacks usefulness compared to simple content. In experiment 2: right/wrong feedback promotes the retention of correct answers, since it provides information about correctness whereas a lack feedback does not.

The experiments were done solely on computers. In each experiment the independent variables stayed the same: Students were given (a) answer feedback, defined as after answering a question the correct answer would show up on the screen. (b) right/wrong feedback, defined as after answering each question either "right" or "wrong" would appear on the computer screen. (c) no feedback, defined as getting no feedback after answering a question. The main dependent variable; how students' scores changed from the pretest to the posttest was the measurement used to determine effectiveness of feedback in both experiments. (Refer to Figure 1 to compare the two experiments).

In experiment one, Forty-eight Duke University undergraduate students were conveniently chosen to participate. All participants took the pretest and posttest which consisted of 24 questions. The independent variable in the study was review vs. no review in between pretest and posttest. On eight of the questions the participants received no feedback, on another eight; answer feedback, and on the last eight; right/wrong feedback. The experiment had five parts: (a) Study period: the students read the reading passages they were going to be tested on. (b) Pretest w/ feedback: after answering each question the feedback would appear on the computer screen before moving to the next question. (c) Review period: half of the participants reviewed the reading passages previously studied before the pretest again, before taking the posttest. (d) Delay period: before taking the posttest a 20 minute delay period was required, and finally (e) the posttest. The only time the type of feedback impacted students' performance was when students received answer feedback. Answer feedback led to improved performance on the final test, when review wasn't allowed.

**Figure 1: Comparison of 2 Experiments**

	<b>Experiment 1</b>	<b>Experiment 2</b>
<b>Participants</b>	48	72
<b>Study Period</b>	X	X
<b>Pretest</b>	X	X
<b>Feedback Method:</b> (1) No Feedback (2) Right/ Wrong (3) Answer Feedback	All participants received all 3 different types of feedback on 24 questions equally (8 questions each)	Group 1: No Feedback Group 2: Right/ Wrong Feedback Group 3: Answer Feedback
<b>Confidence Level</b>		X
<b>Review Period</b>	Half of the participants got to use review the other half didn't	Half of the participants got to use review the other half didn't
<b>Posttest</b>	X	X
<b>Findings</b>	<b>right/wrong feedback ineffective</b>	<b>right/wrong feedback ineffective</b>

In experiment two, Seventy-two Duke University undergraduate students were conveniently chosen to participate. The independent variable in this experiment was review time. Half of the students got to go back and review the tested material after receiving feedback. Instead of using comprehension reading passages like in Experiment 1, the participants translated foreign words into English words. Participants were divided into three groups; each group only received one of the three types of feedback on all 20 questions during the test. The experiment had five parts: (a) Study period: where the students

learned the foreign words and their English word pairs. (b) Pretest. After each question, the feedback type the participants were assigned would show up on the screen for 5 seconds. (c) During the review period 35 participants got the review the 20 word pairs while the other half completed computer puzzles while they waited for the posttest to start. (d) After review all participants received an additional 40 second delay period before they moved on to the (e) posttest. Answer feedback led to improvements on the posttest when students were not allowed to review tested material in between pretest and posttest. All Feedback types positively impacted students' performance on the posttest when students received review time in between pretest and posttest.

I explored experiment 1 and 2 in depth because they directly relates to my question. The findings showed only answer feedback led to a significant improvement in performance on the final test, when review was not allowed. Reviewing the reading passages after receiving right/wrong feedback showed the same results as receiving no feedback at all. The findings are significant to my question because I want to know how best to give students assistance in progressing to the learning goal.

The internal validity was strengthened by the use of pretests and posttests. The study did not explain how the students were assigned to each treatment group but because the researchers excluded participants pretest scores that were outside of the mean, maturation and history were recognized as potential variables to avoid. With the research focused on trying to show the usefulness of right/wrong feedback they used two other variables, answer feedback and no feedback. Both feedback types were controls for measuring the effectiveness of right/wrong feedback. The researchers attended to objectivity by using a computer program to give the participants the feedback as well as the pretest and posttest.

A limitation to this study was that the tested material focused on memorization and recall. My goal as a teacher is for students to learn concepts that will require them to show their understanding beyond memorization and recall. The study was limiting because it was conducted in one day. I plan to teach more than just memorization and recall, I value deep understanding of complex concepts, which usually takes longer than a day for students to truly understand. Besides the test focusing on memorization and recall participants could have been affected by testing because the pretest and posttest were the same and the whole experiment was conducted in one day so this might skew the results of this study.

The findings found that with review, there were improvements across tests in all three conditions. This suggests that in my practice, right/wrong feedback can be an effective means of giving students feedback if students are given review time to go back and process what they did wrong to improve. If I am not giving students this opportunity to review and process the findings suggest I should use answer feedback instead. I want to know more about how student motivation contributes to their processing and use of feedback. This was important because just making time for processing and review may not be enough for students to be engaged and motivated to correct their misconceptions.

**Timing & content of feedback: immediate vs. delayed & standard vs. answer-until-correct feedback.** Butler, Karpicke, & Roediger, (2007) were concerned with how timing and type of feedback are two important factors that haven't been controlled for in previous studies. To disentangle this concern, the researchers evaluated how type of feedback: (a) standard feedback which showing students the correct answer and (b) answer-until-correct feedback, and timing of feedback: (a) immediate and (b) delayed; affect learning on multiple-choice tests. The researchers hypothesized that answer-until-correct feedback should enhance long term retention more than standard feedback because students have to discover the answer opposed to just being given the answer (standard feedback). Also they hypothesized that delayed

feedback would benefit the students more than immediate feedback because it allows students to correct errors because of the spaced presentation.

To conduct the quasi-experiment, 48 undergraduate students from Washington University were conveniently chosen to participate. The participants were randomly assigned to the timing conditions (immediate vs. delayed) when they arrived. Three types of feedback were being measured: (a) standard feedback – correct answer showing on the screen, (b) answer-until-correct feedback - If an answer was incorrect then the computer let the participant keep answering until they answered the question correctly, and (c) no feedback - controlled variable. The multiple choice test consisted of 12 passages taken from GRE and SAT study guides, the 40 question pretest and posttest used knowledge based questions. All participants received 8 - no feedback, 16 - standards feedback, and 16 - answer-until-correct feedback questions. The other variable measured was the timing of the feedback after each question: (a) immediate feedback - given immediately after each question was answered and (b) delayed feedback - given within 10 minutes of the test at the end in experiment 1 and the next day in experiment 2. The researchers used growth from the pretest to the posttest as the dependent variable.

The results indicated that delayed feedback led to superior final test performance relative to immediate feedback on long-term retention. The researchers believed that delayed feedback was more effective on long-term retention because during testing students weren't receptive to the feedback just learned because they were focused on the next question. Delayed feedback gave students a second chance to look at each question closely.

With a sample size of 48 undergraduate students it cannot represent the whole population because it was so small, which brings the generalize-ability of the study into question. The internal validity of the study was strengthened because all participants took the same computerized tests, which confirms the objectivity of the treatments administered. In the findings the researchers attended to research trends that need further investigation, for example pointed out how qualitative action studies tend to find immediate feedback more effective and quantitative studies tend to find delayed feedback more effective. I need to review more studies around timing of feedback because there were other variables that have not been identified. The researchers addressed the lurking variable of "testing effect" in the discussion section. The participants showed improved performance for items initially tested than those not tested, which lets me know that the results were skewed because there wasn't that much time in between the pretest and the posttest.

The results of the study inform my question of finding effective strategies for giving appropriate feedback because standard and answer-until-correct feedback were useful in certain situations which address the "appropriateness" part of my question. The researchers suggested standard and answer-until-correct feedbacks were most useful when students got the opportunity to fully process their correct and incorrect answers on an assignment through a delay process instead of receiving immediate feedback. The findings showed significant difference between delayed and immediate feedback. Delayed feedback led to superior final test performance relative to immediate feedback. These findings suggest that I should provide some sort of delayed time in between the pretest and feedback time so students can have two different opportunities to interact with the assessment, which will help them to process the feedback more readily. Another suggestion offered by the researchers was that I provide an incentive for the student to actively process the feedback. An example of processing given in the study was, after a test or assignment, students correct their tests in order to improve their grades (incentive) and in the process students will learn from their mistakes. I am now wondering how incentives and motivational factors play a role in students actively participating in their learning from their misconceptions.

**Usability of feedback: written comments.** Walker (2009) was concerned with how useful the written feedback was for students to address their misconceptions and or to improve their work in the future. To investigate, she used a qualitative study design. Walker and her part-time associate tutors first documented the types of comments given to students on each assignment. At the end of the course participants were interviewed to figure out: “Which comments were the most useable?” and “What about the comments made them unusable?” The findings indicated that content, skill development, and motivating comments were the top three types of comments given to students as feedback. In the interviews 67% of students believed that the comments were “a lot” or “somewhat” helpful, while 33% believed that the comments were “not much or “not at all” helpful.

Walker investigated three questions: (a) whether content and skill development comments that also offer an explanation will be more readily usable than those that do not. (b) Whether skill development comments will be more readily usable than other categories of comments. (c) Whether motivating comments that explain will be more usable than those that do not. To explore those questions a qualitative design was used which incorporated interviews and data coding of the comments given to students. Brown and Glover’s classifications of comments were the guidelines for which the research team generalized the written comments given on assignments. The classifications were: content, skills, motivation, de-motivation, future study, and resource. These classification informed Walker’s interview questions. Undergraduate students from three Open University course modules from the Technology Faculty were conveniently selected for the research. Walker was the instructor of the online module and she had part-time associate tutors grade and give students comments on their homework submissions. The tutors used a grading guideline given to them by Walker, the full-time lecturer. From the three online courses being taught by Walker, a random selection of 106 assignments were picked to be coded using Brown and Glovers classification of comments.

The results indicated that content and skill development comments that also offered explanations were the most usable comment types. Walker suggested this was true because without explanations students did not understand most comments. The research team also found skill development comments were the most usable to students.

This qualitative study was trustworthy because they used triangulation, that uses both coding; looking at the different types of comments and interviews to later talk with students to figure out the usefulness of the comments written by the tutors. Walker acknowledged that there was more research to be done in this area and that this unique setting in which students were taking online classes and being graded by someone other than their main teacher may have an effect on the results, which clouds the transferability of this study. Also conclusions were hard to draw from this study because I will be in an elementary school context teaching in front of students instead of only interacting with them online. This study was predictable because the findings were consistent with other research. There may be discrepancies with the interpretations made by the tutors in the interview process. The tutors took notes of the participants’ answers. The interviews weren’t recorded which affects the accuracy of the notes being taken because there were no one else there to check the interpretations made by the tutors.

This study helped me think about the importance of listening to students. This helped me to consider asking students what they believe to be important attributes of feedback, in order to make sure students use and understanding the feedback. During the interview process, the tutor’s uncovered two themes: Students wanted to know what they did wrong and why; and to find out what they needed to do in order to get better. This study raised important questions that helped me think about my research question. Another important take away from the study was that content and skill development comments

that also contained an explanation were the most useful/ usable for students. The explanations helped students to see why their answer was wrong and what a correct answer would look like. These are important characteristics of feedback that I want to attend to.

**Types of errors requiring different types of feedback.** Birenbaum and Tatsuoka (1987) noticed a lack for research analyzing performance after receiving feedback with respect to the seriousness of errors committed on assessments. Meaning; past research didn't take into account the variety of ways to get a question wrong on a test. Errors could be small like miscalculation or big errors like not knowing the formula of an equation. The researchers used quantitative design and hypothesized that serious errors would remain at the same level of seriousness regardless of differential feedback treatments, and they would require more extensive action than just feedback. The researchers also hypothesized that non-serious errors could be removed effectively by feedback treatments.

To test the hypotheses the researchers picked three types of feedback methods: right or wrong feedback, which told students if they got the question right or wrong; the second method showed students the correct answer when they got the question wrong; and the third method used gave participants the correct rule in order to solve the problem correctly. The participants were 263 eighth graders from a junior high school in a Midwest town in the United States. This study used single-factor multiple-treatment experimental design, were three different feedback treatments being given to three groups of randomly assigned participants. All students were given the same pretest and posttest, the independent variables were the three different types of feedbacks given and the dependent variable was the improvement from the pretest to the posttest with paying attention to seriousness of errors on incorrect answers. The researchers used computer based testing to conduct this experiment.

The findings of the study revealed none of the three types of feedback had any effect on the posttest scores when students made serious errors on the pretest. They found that when students made non-serious errors on the pretest, the group that received correct rule treatment improved the most. The correct answer treatment was the second most effective and the right or wrong feedback was the least effective feedback method when comparing pretest scores to posttest scores.

To ensure generalizability the researchers used random assignment of treatment groups, which controls for students being conveniently assigned to certain treatment groups. The tests and feedback methods were administered through a computer program which controls for instructors giving students the feedback methods differently. Birenbaum and Tatsuoka used the growth students made from the pretest to the posttest as the means to measure effectiveness of feedback types. This increased the internal validity of the study the growth from the pretest to the posttest was the focus instead of how high the final posttest scores were. An internal validity issue I found with the study is the experiment only lasted one day. With the experiment only lasting one day this could have affected the growth calculated between the pretest and the posttest because students could have become "test-wise" by having taken a pretest that was the same as the posttest all in the same day.

This study helped me think about a new angle I haven't previously thought about when researching feedback with the inclusion of seriousness of error. When students make serious errors, feedback was not enough. This connects with "appropriate" feedback; I now have to consider how serious the error was before delivering the feedback to the student. I would like to learn more about when feedback is appropriate for the learner? In my practice I need to consider looking for opportunities to differentiate instruction instead of just giving feedback when students make serious errors because these findings showed that feedback was not an effective means to change students serious error misconceptions. Also when comparing feedback methods, giving students the correct rule is the most

effective method of feedback and this directly relates to my question and I can use this information to inform my practice because it is the most informative feedback given out of the three treatments.

**Conclusion.** Feedback has one goal; to help the student bridge the gap between current understanding and the learning goal. With this goal in mind feedback has many components that a teacher needs to consider after formatively assessing. Some of the components I investigated were: timing, mode, and content of feedback. Before considering the components a teacher needs to attend to seriousness of errors and understandability of feedback, which are areas that can block a student from receiving the feedback. The most important finding that I will consider paying attention to as a teacher is the usability and understandability of the feedback (Walker, 2009). If students cannot understand and use the feedback on assignments to improve their current conceptions then I have wasted my time as well as the students time. To make sure students are understanding and actively using the feedback given it is vital to provide opportunities for students to review and process, no matter the content, and mode of feedback (Butler, et al., 2007; Fazio, et al., 2009). When feedback is written out it may become data for both the teacher and student to return to, as opposed to oral feedback which may be forgotten (Kaftan, et al., 2006; Kostos & Shin, 2010, Shirbagi & Kord, 2008). Finally, feedback can be used to generate an “assessment conversation” between the teacher and individual students, which could ensure that students are aware of their current understanding in relation to the learning goal (Kaftan, et al., 2006; Torrance & Pryor, 2001).

## **How Can Assessment Be Used In Order To Get To Know Students As Individual Learners?**

*by Kristine Boisen*

The research question for this section of the paper is “How can assessment be used in order to get to know students as individual learners?” I find the prospect of differentiating instruction for a class of between 24-28 students to be complicated. How can I individualize my lessons so every student gets all they need? I attempted a limited amount of differentiation during my fall student teaching placement. After teaching a math lesson, I knew there were a few students who needed additional help. I asked the class to meet me at the back table if they needed additional help with the math concept. I was very surprised when over half of the class came to the back of the room. Most of these students knew how to do the math, but lacked confidence or something else I had not identified. I decided I needed to be able to see what individual students were thinking in order to give each one what they needed. Through this attempt, I learned assessment data is not the only data necessary for success.

For the purposes of this section, *data* is information obtained from and about a student. It is telling the teacher more about the individual student than can be seen in a “single look” summative assessment. My hope is that the following articles will provide me with strategies for collecting this information from students, as well as clarify some of the types of data used by experienced teachers in the classroom.

While sets of scores from assignments provide important information, there is much more to each student than this form of assessment reveals (Herman, 2010). There are abilities and challenges for each student completely unique from those of every other student (Tomlinson, as cited in Moon, 2005). There are many decisions to be made within the classroom and high quality data is a key component of these instructional decisions (Moon, 2005). This information about students is the tie to the overarching question being investigated. What data will allow the teacher to see what students are thinking? How can information be collected and compiled so that the teacher is able to see individual students as learners?

When I began this research process, particular names appeared repeatedly in my searches for published articles. Most of the articles available from these authors were opinions based on years of observation or reviews of literature. I had difficulty locating peer-reviewed research. What started out feeling simple, quickly became much more complicated. The search terms used for this paper included “differentiated instruction,” “data,” “assessment strategies,” “student achievement” and “individualized instruction.” My searches revealed research within the genre of action research. The limitations present in the action research studies I selected were: sample size; a lack of clearly defined variables; and control groups were absent. I found many of these action research studies provided information on strategies used by experienced teachers.

During my research, I found an article by Holdren (2012), which discussed alternative assessments. For Holdren, an alternative assessment was one that looked completely different from a traditional assessment. She had her students prepare an art project to demonstrate their level of reading comprehension from a class text. Throughout the project, she learned a lot about how her students sought help, faced challenges and collaborated with one another. While it was not the goal of her study, her observations gave her a great deal of insight into each one of her students as individual learners.

Kaftan, Buck and Haack (2006) stated, “Each learner brings different experiences and expertise to the classroom” (p. 44). As a teacher, I need to know about my students, not just their level of expertise, but the variety of experiences that have formed them into the individuals they are. Understanding more about the varied experiences of each learner in the classroom could help a classroom teacher better understand how individual students think.

Journals represent one method teachers could utilize to collect information from students in the classroom (Kostos & Shin, 2010). When data is kept in a student journal format, some of the responsibility for data collection is on the learner. The journal format also gave teachers a place to record feedback and conduct an ongoing “assessment conversation” with students (Kaftan, et al., 2006). Kostos and Shin described an assessment conversation as an alternative form of assessment with the power to provide a great deal of information on how an individual student is thinking. They stated the “conversation” in the journal allowed the teacher to probe an individual student’s understanding and students utilized subject specific language and thinking in their writing. In other words, students’ learning was being advanced because of their use of the appropriate language within the journal as part of the back and forth conversation.

In order to understand how a student thought, teachers needed to see the qualities each student possessed as a learner (Holdren, 2012). Goals set by individual students helped them determine where they were in the learning and students’ success was personalized and their motivation to learn was increased (Martin, 2013). These personally set goals could help teachers understand individual students as learners. When students have set goals for themselves and kept a record of their progress, they were becoming self-regulated learners (Pape, Bell & Yetkin, 2003).

A self-regulated learner was defined as one who named the strategies used and needed to use next in order to further their learning (Pape, et al., 2003). This information could be a tool to allow the teacher to see how a student is thinking and whether they are internalizing what is being taught. This information led me to think about whether a student’s self-assessment could also be a valuable source of data (Brookhart, 2004). Self-assessments helped students set their own goals (Martin, 2012). Teachers may be able to gain a clearer and more complete idea about the thinking of their students through reviewing students’ self-assessments.

**Alternative assessments.** Holdren (2012) wanted to find out if the creation of an individual art project would work as an alternative form of rigorous reading comprehension assessment. This research is included in this paper because Holdren stated that in order to provide alternative forms of assessment, a teacher should have a good understanding of students' learning styles and their ability levels in terms of the nonverbal concepts being assessed. In addition, the observations made in the study about the students were full of important information about individual students, such as how they sought help, collaborated with peers and addressed challenges.

In order to address her question, the teacher/researcher invited students from three of her four 11<sup>th</sup> grade English classes to participate. Twenty-one students, who represented a wide range of ability levels, chose to participate and the study was conducted at the end of a literature unit. The students were given a rubric, some basic instruction on the definition of and interpretation of art, as well as use of art tools. They were then asked to create individual projects that reflected their understanding of the class text. The research data collected included anecdotal notes during classroom observation, student scores from the assessment rubric, videotape of the classes provided evidence the researcher could refer back to, photos, and 12 students were invited to participate in a follow-up focus discussion. The follow-up discussion was also videotaped and analyzed to confirm themes.

The teacher/researcher was able to observe students as they prepared their art projects. She saw how and when they sought help, collaborated with peers and faced individual challenges. The close observation was made possible, in part, by the videotaping done in the classroom during the study.

Holdren's (2012) findings indicated "using art projects to assess higher level reading comprehension skills may be both rigorous and enjoyable for students" (p. 703). Her findings also indicated that the level of students' understanding of the text was represented in the scores they earned when the prepared rubric was used. Several of the students in this study honestly admitted they had not read the texts and this lack was also reflected in their scores.

The study's small sample represented a wide variety of ability levels in art and reading. The school where this study was conducted had a strong art focus and was rated as a successful school in terms of standardized tests. In terms of transferability, it was difficult to compare this classroom with my elementary classroom in a school struggling with success at standardized tests. It was difficult to measure the effect of the school's strong arts focus on the study's findings.

This study included no information about its confirmability or dependability. There was no documentation about rechecked data or whether or not the researchers looked at studies with findings that contradicted those presented. No information was included about other changes that may have happened with the students throughout the course of this study. With this in mind, I was not completely sure the findings were based solely on the use of the alternative assessment.

This article informed my question on collecting data for differentiated instruction because of the information collected during observations. The way in which students: seek help, address challenges and collaborate represents data that can help a teacher know individual students better. In addition, the teacher in this study learned about students' learning styles, their ability levels in terms of the nonverbal concepts being assessed, students' familiarity with art mediums, their confidence levels and how students defined "art" (Holdren, 2012). All of these qualities could be important to understanding students as individuals. The additional information obtained about individual learners was not part of what the teacher hoped to discover, but the inclusion of this information was helpful for this project. Further research will be required to understand how this kind of data can be organized and updated in ways that do not monopolize a teacher's time.

**Formative assessments.** Another study I reviewed entitled, “Using Formative Assessments to Individualize Instruction and Promote Learning” involved formative assessments. The classroom teacher/researcher in this study by Kaftan, Buck and Haack (2006) wanted to find out how to better assess what students understood. She was also concerned about responding to the diversity of students in the classroom while also attempting to meet the summative assessment schedule of the district. This article was included in my research because of the findings surrounding “assessment conversations” and the wealth of data they may provide about individual students for a teacher.

This was a qualitative, action research study within a larger inquiry project. The classroom teacher, a university professor, and a graduate student formed a collaborative inquiry team who collected and analyzed data gathered from formative assessments, student interviews and the teacher/researcher’s self-reflection. The sample was made up of the teacher/researcher’s sixth grade science students and took place over a 17-week period. During the first nine weeks, the students were interviewed about their learning. Assessments given during class indicated the students had a solid understanding of the material. The interview data, however, showed students were displaying “performance without understanding” (Kaftan, et al., 2006, p. 46). Student understanding, in terms of this study, meant a student should have been able to explain what had been learned rather than repetition of memorized terms. At the conclusion of the study, the final assessment document allowed the students more space and choice of format (writing or drawing) for students to demonstrate their understanding more completely.

In the findings, the teacher/researcher determined her formative assessments needed to provide a format for the teacher and individual students to have an “assessment conversation.” These written conversations allowed the teacher to guide individual students in deepening their understanding of the material. An additional and unexpected benefit of these conversations was the relationship built between student and teacher based on the fact the student had clear evidence the teacher was listening (Holdren, 2012). It seems that a relationship between teacher and students could be important in understanding students as individual learners.

The sample for this study was small and selected based on convenience. Little information was presented regarding the sample demographics and these facts limited my ability to compare it with my classroom. The combination of the three kinds of data collected and reviewed presented a clear picture that the findings were based on the collected data. In addition, the study’s findings compared well with other information on formative assessments and their use in the classroom (Butler & McMunn, 2006). The study included no information about attempts to recheck the data or to find any negative instances that may have contradicted the findings. The detailed descriptions of the assessments used and modifications made may make it easy to see where these same strategies could be used or where modification would have to be made in a different setting.

What seemed important about the study was that the researcher/teacher used the formative assessment process and feedback to guide individual students in further developing their understandings. She also used the information from the formative assessment process to modify her classroom instruction to ensure she was meeting the needs of all of her students and this directly related to my research question. Butler and McMunn (2006) stated, “Research demonstrates that student achievement is increased (particularly for low student achievers) by the use of classroom assessment when such assessment features good feedback to students about their performance, sets clear standards for learning, is ongoing so it can be used to monitor student growth and progress and is used to modify instruction to meet the needs of the student” (p. xxv).

This study demonstrated how to open and record dialogue with individual students in an “assessment conversation.” The conversation could be used to help the teacher develop differentiated instruction based on the needs of individual students. These conversations could provide a unique opportunity for teachers to continually and individually assess students in such a way that brings the students to a deeper understanding of the content. “Real learning for this teacher involved students defining, redefining, revising, and expanding on initial conceptions. It involved a mastery orientation rather than performance goals and an ongoing process rather than merely a product to grade and record” (Kaftan, et al., 2006, p. 49). When classroom instruction was guided by formative assessments, it was focused on students’ learning and the principles of learning (Kaftan, et al.). Another benefit of student journals was that recordkeeping happened simultaneously and an ongoing record was created. The teacher simply had to pull out the student’s journal to access the data whenever needed.

**Student journals.** A study by Kostos and Shin (2010) entitled “Using Math Journals to Enhance Second Graders’ Communication of Mathematical Thinking” I reviewed focused on the use of math journals. The teacher/researcher wanted to find out if writing in math journals would improve her students’ communication of their mathematical thinking. I was interested in this study because I had not previously considered journal writing to be a form of data collection for the purposes of differentiated instruction.

In order to address the question, the teacher/researcher used mixed methodology. The setting for this study was a second grade, mixed-ability classroom in a Chicago suburb. The class consisted of twenty students, but only 16 were included in the sample. The study was conducted over a five-week period, during which the students wrote in their math journals a minimum of three times per week. The students were given 16 different prompts for writing. The teacher modeled the first three prompts and taught three mini-lessons to ensure students understood how to read and respond to the prompt. Data was collected from the pre- and post-assessments, students’ math journals, interviews with students and the teacher/researcher’s reflective journal.

Kostos and Shin (2010) found that the math journals served as a communication tool between individual students and teacher, as well as an assessment tool throughout the study. At the end of the study, all of the students showed improvement between pre- and post- assessment; journal writing (assessed with a rubric) improved their ability to use mathematical vocabulary; and the journals provided insights into the students’ thought process and understanding of mathematical concepts.

The teacher/researcher was intentional about the inclusion of enough data to facilitate triangulation, leaving little doubt the findings are based on the data from the study. Data collected included the students’ scores on the pre- and post-assessment, journal entries (scored according to a rubric), the teacher’s reflective journal, and some student interviews. This allowed the teacher/researcher to clearly identify themes. The study’s findings were consistent with the collected data.

This study had a small and convenient sample. A thick description was included that described the students, setting, and process used, meaning, I could compare this setting with my own classroom. I believe the findings are trustworthy because of the inclusion of the pre- and post-assessment data corresponded with the rich descriptions of what happened in the classroom during the study. This was the only study I read where the researchers included any information about attempts to validate their own findings. In my limited experience with research, this inclusion made an impression on me. The teacher, as researcher, noted she had insights an outsider may not have had and that her insight allowed her to analyze the collected data at a deeper level. The findings of this study paralleled the findings of Kaftan, et

al. (2006) and Pape, Bell and Yetkin (2003) that there may have been a positive impact on learning when students wrote in either a journal or filled in a formalized tool.

In the quantitative part of the design, the teacher/researcher's use of a pre- and post-assessment to measure growth made it a one group, pre-test/post-test pre-experimental design. The internal validity threats related to the teacher/researcher's failure to include information about events happening outside of the classroom that could have affected the findings. There was limited potential of a threat with regard to the test because the study took place over five weeks. The second grade students might have forgotten much of the information from the pre-test by the time they completed the post-test five weeks later. This meant the results offered by the pre-test and post-test strategy could have been an accurate indication of how much students learned throughout the study. The teacher/researcher had not included a control group. She also had not conducted the same type of study that utilized a different treatment. This meant there was a question about whether a different teaching strategy might have offered the same results.

This article informed my question on the data necessary to develop differentiated instruction because the students' math journals appeared to provide a wealth of information for the classroom teacher. As stated in the findings, "The students' math journals provided insights into the students' thought process and understanding [*sic*] of mathematical concepts, rather than simply checking the right answers" (Kostos & Shin, 2010, p. 229). In the journals, students used mathematical knowledge and vocabulary in a way that helped them, not only on standardized tests, but also in applications outside of school. In this way, the journal served as a differentiated formative assessment, personalized for each student. The writing in the journals became data for the teacher's use in planning instruction and allowed her to see how students were thinking.

The study pointed out that the use of journal writing allowed teacher and students to have conversations about student understanding without fear of what other students might have thought. In addition, it was noted that the journal format allowed students the freedom to use drawings to communicate their thinking when words were not working (Kostos & Shin, 2010). The conversation in the journals between teacher and student, as well as the freedom for the student to draw rather than write, could provide rich data for a teacher to better understand individual learners and to develop differentiated instruction. In addition, the Kostos article indicated that the "students' math journals provided insights into the students' thought process and understanding of mathematical concepts, rather than simply checking the right answers" (p. 229). This could allow the teacher to "see" student thinking and locate patterns in misconceptions or in comprehension and provide instruction individualized to the needs of the students.

This study and the article by Kaftan, et al., (2006) noted there was a time commitment involved in the use of journals in the classroom. Kostos and Shin (2010) discussed the time devoted to writing in journals during math class, and the time required by the teacher to evaluate the information written in the journals, was a commitment to acquiring a valuable resource. Kostos' findings agreed with those of Kaftan, et al., (2006) that the time commitment paid off in terms of an improved focus of classroom instructional time (Kostos & Shin, 2010). I believe the information in the students' journals could be extremely valuable data for understanding students as individual learners and informing the development of differentiated instruction.

I determined that I needed to examine other research on the use of journals in the classroom to see if the findings agreed with these conclusions. While the teacher/researcher included her hope that the journals would provide a "safe" place for students to take intellectual risks, there was no information included about whether she addressed the topic of "risk" with the students. Another area for further study

would be research relating to intellectual risks in the classroom. The trust and risk-taking aspects involved in journal writing are important to consider if the data collected in the journals is to be deemed a valid reflection of student thinking.

**Formalized tool.** Pape, et al. (2003) created a study to investigate the development of students' identities as mathematicians through the use of a planning/reflection tool. In addition, the teacher/researcher wanted to see if using this tool would help the students become self-regulated learners. In terms of this study, a self-regulated learner was one who could name the strategies they should use in order to improve academically. The formal tool was created with prompts that asked students to name the strategies used, or to be used in the future, to improve their learning. The Kaftan, et al., (2006) and Kostos and Shin (2010) studies led me to look for a study that utilized a formalized tool as opposed to having students respond to a prompt in a journal. I included this study in my research because of the focus on the planning/reflection tool. I wanted to see how this would inform my question with regard to data on understanding students as learners.

In order to address the question, the teacher/researcher teamed up with a university professor and a doctoral student to conduct a qualitative, action research study. The team planned this study over the course of a year while they worked in a professional development setting. A second year was spent co-teaching and observing in a public school classroom. The classroom was located in the Midwest and the student body represented the cultural and economic diversity of an urban school. Two seventh grade math classes participated in the study. One class was a pre-algebra class of 29 students with above average mathematical experience and ability. The other class of 25 students (one elected not to participate) was considered "below-average performers" who often struggled with mathematical concepts. The team created a "Strategy Observation Tool" for students to complete daily, where students noted observations about their use of strategies to learn mathematical concepts. Some of the strategies students used to study were: process of elimination, guess and check their work, or they explained the use of a mathematical skill to someone outside of the classroom.

The findings indicated the "Strategy Observation Tool" was ineffective for students at either end of the spectrum of ability levels. In other words, it did not work for all students. It was mainly effective for students with ability levels in the middle range.

Many examples of recorded classroom conversations were included in the study, which created a clear window into what took place in the classroom. Unfortunately, the researchers' descriptions in the study did not label which class the students were from and it was difficult to know if the team was simply highlighting the work of one class over the other. This was important to note because of the difference in challenges faced by the two classes.

The sample for this study was small, based on convenience, and consisted of seventh grade students. It was difficult to compare this seventh grade classroom with my elementary classroom. The detailed descriptions included the strategies the teacher/researcher used in her classroom, as well as modifications made to her teaching after reviewing data (including video). This additional information presented a picture of what went on in the classroom.

My attention was first drawn to this study because the authors directly addressed differentiated instruction: "Thus, classroom teachers need to provide differentiated support for individual students. This support should include multiple opportunities for self-evaluation with the assistance of others who provide immediate feedback." (Pape, Bell & Yetkin, 2003, p. 195). The student self-evaluation is another example of an additional type of data that could be used to better understand students as individual learners and then develop differentiated instruction. This ties with the use of student journals in the

Kostos and Shin (2010) and Kaftan, et al., (2006) studies. This study also responds to an additional question that arose during research regarding how much structure to give students in their self-reflection. The findings also have associations to the “Personal Best” goals research of Martin (2012, discussed below), where students used self-reflection to set goals for themselves. As a follow-up to this research, I would like to find additional studies on the effects of teaching students to be self-regulating, that is, to be able to communicate, in writing, where their ability level is and what strategies they can use to advance it. The data provided by students in communicating their current ability level and the strategies they have available to improve could be helpful in seeing how students are thinking about themselves and their knowledge of available strategies. In this sense, the formalized tool could be used as a formative assessment, allowing the teacher to see which strategies students feel comfortable with and where they may be ready to be stretched.

This article informs my question on the data necessary to develop differentiated instruction by its focus on the “Strategy Observation Tool.” While this tool was not as effective in helping students as the research team had hoped, this tool is similar to having students write about their learning in math journals. The “Strategy Observation Tool” was more focused because students filled in answers to specific questions rather than responding to a journal prompt.

**Student goals as data.** When I first located the article entitled “The role of personal best (pb) goals in the achievement and behavioral engagement of students with ADHD and students without ADHD.” I was intrigued by the idea that a goal set by an individual student could affect their academic engagement. If a self-established goal could affect academic achievement, could it also be used to better understand students as individual learners? Martin defined a “Personal Best” goal as one set by the student based on their current level of ability and where the student would like to improve.

This quantitative study involved the use of a survey that included questions of socio-demographics, standardized national testing scores, personal best goals, behavioral engagement items and personality items. The sample of students with a diagnosis of ADHD (Attention Deficit Hyperactivity Disorder) consisted of 87 students from nine junior high and senior high schools in major urban areas. The sample of students diagnosed with ADHD for this study was large compared to similar studies. The sample of students without a diagnosis of ADHD was 3,374 students from the same schools and grade levels as the sample of students diagnosed with ADHD. The students’ self-reported standardized test scores were compared with data from the national testing agency to determine their validity. Adjustments were made to account for the compared sample sizes when the data was analyzed to ensure the difference in size did not affect the findings. Martin’s (2012) intent was to generalize the results to the broader population by establishing a diverse sample consisting of students with a diagnosis of ADHD and students without a diagnosis.

Martin (2012) included some examples of personal best goals such as doing better on a current assignment than a previous one or applying greater effort on a particular assignment than on a previous occasion. Martin’s study also measured the students’ association with goal setting and their individual academic outcomes (achievement and behavioral engagement).

Martin’s (2012) findings indicated that setting “Personal Best” goals might have had a positive influence on the academic achievement of students with and without a diagnosis of ADHD. Martin quoted research by Dweck and others that compared favorably with his findings.

The survey used in the study was only completed one time, which made it a single “snapshot” of the participants. Martin’s inclusion of students not diagnosed with ADHD improved the generalizability of this study because it added diversity to the sample. Both groups reported the setting of “Personal Best”

goals might have had a positive relationship to their academic achievement. The researcher noted that there might be features particular to ADHD that would render the effects of goals qualitatively distinct between ADHD and other groups. The missing data for this study was less than the 5% benchmark, which added to the study's validity. The data on the survey was self-reported by the students. There was no information included about the students' level of familiarity with "personal best" goals.

This article informs my question on information to understand students as individual learners by its focus on students setting goals for themselves and then working to meet those goals affects academic achievement. It may be that knowing how students view their current ability and the goal(s) they are trying to reach could provide data to help teachers in differentiating instruction. "The pursuit of (Personal) (Best) goals appears to be a promising approach to promoting the academic potential of diverse groups of learners" (Martin, 2012, p. 103). The findings compare well with research by Dweck (as cited by Martin, 2012) that focused on helping students think about the mindset behind their work and reflecting on it. More specifically, students adopting growth mindsets can positively affect their academic outcomes (Dweck as cited by Martin, 2012). In another article, Martin (2013) stated students striving to achieve personally set goals may reduce the competition level between students and with the reduction in competition, a more collaborative atmosphere may be created in the classroom. This collaborative atmosphere may benefit students by allowing them to feel at ease in the classroom. This ease may lead them to higher levels of engagement and better achievement, paralleling Yair's (2000) findings. Personal best goals may also give the teacher insight into how students think about their progress in the classroom.

The researcher had not included any information about the effects of any other types of goal setting. An area for further research would be to locate studies using different kinds of goal setting to see if the outcome differs. It would be helpful to find a longitudinal study to see if "Personal Best" goals affect student achievement over time. In order to make any definite conclusions from this study, it would be important to find additional research on the features of ADHD that also may have impacted the findings from this study.

**Conclusion.** My review of the literature indicates it may be useful for teachers to view data with a much broader lens. Teachers may find information on students as individual learners to be helpful. The goals students set for themselves and their use of strategies could be informative. When students write in journals, that information could be used as data for instructional decision-making. Journals could also be used for teachers to give students specific written feedback and provide a forum for an ongoing conversation between teacher and individual student (Kaftan, et al., 2006). Formalized tools could be created in place of journals to allow students to write information to express their understanding (Kaftan, et al., 2006; Pape, et al., 2003). When alternative assessments are utilized, the data collected can also inform decisions about differentiated instruction. The data from alternative assessments may be even more descriptive about individual students because of the potential for students' passion and content knowledge to come together as they create their individual projects (Holdren, 2012). In other words, they found students' projects accurately reflected their understanding of the content but those same projects also showed them what students were especially interested in within the pages of the content. It may be that using all of this information, including student interest, could allow teachers to make instructional decisions that individualize instruction.

Self-reflection could be a valuable tool for teachers and students. It could allow students to set goals and be metacognitive about strategies to guide their learning (Martin, 2012; Pape, et al., 2003). The pathway is then opened for teachers to give students feedback on their learning in an assessment conversation (Kaftan, et al., 2006). When the teacher is communicating about the formative assessment

with students, the communication then becomes feedback from the teacher to the student. When this feedback is written out, it becomes data both the teacher and student can return to (Kaftan, et al.; Kostos & Shin, 2010). Students' self-assessments could be useful data for a teacher in developing differentiated instruction (Brookhart, 2004, Pape, et al. 2003).

### **Overarching Question Conclusion**

Differentiated instruction based on assessment is one way for a teacher to see every student has access to academic success. Paying attention to the variety of ways teachers formatively assess students and then provide them with usable feedback, while also tracking their progress, is one way to improve learning. Students' interests, needs and strengths can also be taken into consideration while planning instruction to potentially increase student engagement and achievement (Yair, 2000). The assessment framework can be changed so that the teacher becomes a facilitator by implementing choice to increase student motivation and autonomy (Waters, et al., 2004).

Formative assessment could be used on a regular and consistent basis to see how students are thinking. Questions can be crafted in ways that allow teachers to obtain more information about individual learners, and not solely for the purposes of measuring content knowledge. When instruction is focused on the varied needs, challenges and past experiences of each student, it becomes learner-centered.

Formative assessment can also open communication between teacher and student. This open communication can serve as a diagnostic tool; a responsive dialogue between learner, teacher, and text (Kaftan, et al., 2006). When the teacher uses an open forum to communicate the learning goals and the criteria that the teacher will use to assess how students grasp concepts, then this communication helps the learner understand what needs to happen next in order to deepen learning (Pedrosa de Jesus & Moreira, 2009; Kaftan, et al.). The conversation that ensues also works to build relationship between teacher and individual student (Kostos & Shin, 2010).

Self-reflection can be a valuable tool for teachers and students. It can allow students to set goals and be metacognitive about strategies to guide learning (Martin, 2012; Pape, et al., 2003; D'Souza, 2011). In order for this metacognition to happen, teachers must provide time and opportunity for students to reflect in order to make improvements (Butler, et al., 2007; Fazio, et al., 2009). Teachers need the same time for reflection in order to increase their understanding of what is and is not working within the classroom, as well as how to improve in order to better facilitate future student learning (D'Souza; Torrance & Pryor, 2001).

Feedback is the communication that happens between teacher and student to decrease the gap between current understanding and the learning goal. Research indicates that formative assessment without feedback does not help students revise their thinking because their misconceptions have not been addressed (Shirbagi & Kord, 2008; Torrance & Pryor, 2001). Therefore, within the "assessment conversation" between teacher and individual students, feedback then becomes the platform for an ongoing dialogue about the gap between current understanding and the learning goal (Kaftan, et al., 2006; Kostos & Shin, 2010, Shirbagi & Kord; Torrance & Pryor). When students engage in ongoing conversations with the teacher about learning goals, then feedback may become the instrument students use to revisit their thinking.

In our introduction we listed some points of teacher resistance to the incorporation of differentiated instruction. For example, teachers often feel there is not enough time to individualize

instruction (Tomlinson, et al., 2003). A couple of studies pointed out that the process of collecting data does take time, but there is a benefit returned because instruction is then more focused on the needs of individual students (Kaftan, et al., 2006, Kostos & Shin, 2010). Another point of contention in implementing differentiated instruction had to do with teachers' belief that students with specific needs would be singled out (Weber, 2013; Tomlinson, et al.). However, our research indicated students could be grouped in a variety of ways to avoid this undue attention or a written "assessment conversation" could take place between the teacher and an individual student within the pages of a journal (Kaftan, et al., Kostos & Shin, Waters, et al., 2004). Finally, research implied that when teachers utilize guided inquiry it could be a powerful tool for self-reflection in order to change teachers' mindsets with regard to differentiated instruction (D'Souza, 2011).

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# Differentiated Instruction: Helping Students with Specific Learning Needs

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*Jessica Cohoe, Nick Morais, & Christina Vernon*

Since today's classrooms contain a variety of diverse learners, teachers need to utilize strategies that will provide access to the learning for each individual. This review of the literature focuses on effective strategies for differentiating instruction for students with specific learning needs in the general education classroom. For students to succeed academically and socially in the classroom and beyond, we need to incorporate strategies that result in greater access and equality for all learners. The first and second section of this review focuses on effective strategies for supporting students with Autism Spectrum Disorder (ASD), and learning disabilities (LD) specific to reading and writing. The final section of the review considers the implications of incorporating students with specific learning needs into the general education classroom. We conducted this investigation by searching the academic databases EBSCOHost, JSTOR, Science Direct and drawing from articles based on previously written literature reviews. Key insights from the review include intentionally modeling strategies and providing feedback to students. Also, when students with specific learning needs are incorporated into the general education classroom, teachers need to attend to how varied students interact together. Since most of our studies took place in special education classroom, we would like to further investigate how to (1) teach these specific strategies, and (2) structure inclusive classrooms so that students of various abilities and skills interact in positive and collaborative ways.

**Keywords:** *differentiated instruction, autism spectrum disorder, learning disabilities, mixed ability groups*

Today's classrooms are filled with students who possess a wide range of learning needs. There is also a concerted effort towards creating inclusive classrooms, where students with various learning disabilities or health impairments are integrated into the general classroom (Ernest, Heckaman, Thompson, Hull, & Carter, 2011; Tomlinson et al., 2003). Unfortunately, students with special needs continue to do poorly in our classrooms (Kutash, Duchnowski, & Lynn, 2009). As a result these same students have been classified as passive learners (Mastropieri et al., 2001). Passive learners can be described as students that have an inability to transfer the use of strategies to different situations. Differentiated instruction provides opportunities for special education students to reach higher level academic skills through the use of different strategies (Tomlinson et al., 2003). Learners with special needs will come into the classroom with different starting points. By using differentiated instruction, educators are providing the resources to that help students to grow and develop from that individual starting point (Tomlinson & Imbeau, 2010). Differentiation of instruction has shown through experimental research that it is also a strategy that can

help all students in the classroom to achieve academically (Stavroula, Leonidas, & Mary, 2011). The purpose of this literature review is to investigate: what are effective strategies for differentiating instruction for students with specific learning needs in the general education classroom?

Differentiated instruction is an approach of teaching that encompasses all stages of instruction from planning to assessment with a focus on addressing the individual learning needs of each student (Tomlinson & Imbeau, 2010). Differentiation is not just for students with specific learning needs, but an approach that can be used for all students. We have chosen differentiated instruction to support students with specific learning needs because in the general education classroom, with around 30 students, we need effective strategies that will help these students succeed academically by meeting standards and learning objectives. While accommodations for students with special needs are important, differentiated instruction is a wider concept that affects the planning, instruction, and assessment, and attends to the needs and interests of each student.

Differentiated instruction is necessary for today's classrooms (Tomlinson et al., 2003). Tomlinson & Imbeau (2010) argue that if the classroom doesn't work for everyone, it doesn't work for anyone. Tomlinson gives an example from her teaching career where the task she was asking of her students was too difficult for them. When she asked the class a question, all eyes turned to one student who was doing particularly well in the class. With a sigh, he answered the question. At this moment Tomlinson realized that not only was she not helping all the students who found the task too difficult, she was not pushing the other student to grow in new ways (Tomlinson & Imbeau, 2010, p. xvii). As teachers, our job is to provide challenging learning opportunities for all our students and to support the growth of the skills and knowledge they bring to our classrooms.

Differentiation is also necessary because of the increased focus on high-stakes testing for *all* students, including those in special education. As a result, teachers must attend to the needs of these students so they can experience success (Duchnowski, Kutash, Sheffield, & Vaughn, 2006). Not only are students being graded on these tests, but there has also been a focus on student performance based evaluations for teachers. Even without these current trends, as educators we must attend to the needs of special education students because every student in our classroom is worthy of dignity and respect (Tomlinson & Imbeau, 2010). Effective differentiated instruction should result in greater quality, equity, and justice for all students in the classroom (Stavroula et al., 2011).

While the benefits from implementing differentiated instruction seem clear, one significant challenge with differentiated instruction is applying it in the classroom. While theoretically these practices are ideal, teachers often doubt the application and the feasibility of implementation (Tomlinson et al., 2003; Duchnowski et al., 2006; Kutash et al., 2009; Moni et al., 2007). An area that researchers have explored is the disconnect that occurs when teachers are *told* what strategies to implement. For example, even when given extensive training on using differentiated instruction in writing, teachers struggled to implement the practice into their classroom (Moni et al., 2007). However, when teachers are involved in the process of choosing the methods and strategies for differentiation, they are more effective at implementing them (Duchnowski et al., 2006; Kutash et al., 2007).

While differentiated instruction can be used to address learner interests and profile, the focus of our project is on differentiating for student readiness especially for students who are identified as needing special education services. Student readiness focuses on what the student is bringing to the classroom - what is their prior knowledge, skills, and understanding? "The goal of readiness differentiation is first to make the work a little too difficult for students at a given point in their growth, and then to provide the support they need to succeed at the new level of challenge" (Tomlinson & Eidson, 2003, p. 3). As new

educators who are committed to serving the needs of all our students, we are focusing our investigation on how we can implement strategies that support students with specific learning needs, incorporating them into the life of our classroom using differentiated instruction. As classrooms continue to become more diverse and the demand to meet students various needs increases, educators are left with the dilemma of how can we effectively teach all students. To contribute to the educational community, individually we look at three areas in which educators can work to engage such strategies.

In the first section of the paper Christina Vernon focused on what specific strategies are most effective for students with autism spectrum disorder (ASD) in the whole, integrated, inclusive classroom. As mentioned, there have been recent movements in education for inclusive classrooms, where students with special learning needs such as ASD are involved more in general education classes rather than special education classes. Differentiation is important to support such learners as students with ASD can have impairments in regards to social interaction. From the research and studies reviewed there is data to support the effectiveness of providing additional scaffolding for small group conversation training, structured inquiry, visual and video supports and behavior modeling in instruction. Implementing these strategies in one's teaching practice can help provide students the tools and understandings to alleviate the struggles that stem from social interaction in the classroom, such as group work, partner collaboration and even whole class sharing (Bossaert, Colpin, Jan Pijl, Petry, 2013). I looked at how these strategies, aimed to help students with ASD develop these socialization skills, could be generalized to whole classroom settings.

In the second section of the paper, Jessica Cohoe focused on strategies that will support students in literacy and foster a sense of efficacy. As students move into secondary content classrooms, the demands for reading and writing become greater. Students are expected to read and produce complex informational texts. For students with learning disabilities (LD), these tasks can become daunting and hinder their academic success (DiCecco & Gleason, 2002; Sturm & Rankin-Erickson, 2002). The studies in this section focused on students in the special education setting. As a general education teacher, I analyzed the studies through the lens of applying them in the inclusive classroom through differentiated instruction. This section of the paper is on effective strategies for these students to both grow in their academic ability and in their confidence in themselves as readers and writers.

The third section Nick Morais investigated differentiation and its effectiveness with mixed ability groups. While Classrooms have been attending to students with different special abilities through ability grouping, or what is also called "Tracking". Students are grouped together with those of similar abilities in these "ability groups" (Resnick, 2010). The topic of ability grouping is often debated, the main issue of concern is that the achievement gap increases between tracking groups, because each group is moving at different paces, and with different materials (Poole, 2008). Mixed ability grouping are groups where students of different abilities interact with each other in a group setting (Webb, 2010). The concern for this type of grouping is that students with special needs will not be able to connect with other students socially and academically. This section of the paper is on the use of differentiation in mixed ability groupings being an effective strategy in general education classrooms.

Having examined a few studies in each of these three areas, the final section of the paper addresses our findings and the implications for our practice.

## **Strategies to Support Students with Autism Spectrum Disorder** *by Christina Vernon*

The classroom is a unique format in which students with varying backgrounds, experiences and knowledge come together for the shared purpose of learning and furthering their education. With so many diverse learners comes a wide range of needs, which I, as their teacher, must work to not only understand but also attend to in an effort to ensure equal access to learning and growth. Our group focused on addressing effective strategies for differentiating instruction to meet the needs of those students who have specific, special learning needs. One particular population of students I have focused on are those with autism spectrum disorder (ASD). According to the research, approximately one in one hundred and ten students fall within the spectrum (Center for Disease Control 2009), with numbers continuing to rise (Vaughn, 2007, p. 148). The research I conducted focused primarily on education at the secondary level. There is a recent trend in our nearby district and several others pushing for inclusion for students with special needs, such as ASD. This means more time spent in general education classroom and less in individualized, special education classes. It is necessary for educators to engage this research to see what practices are most beneficial to support learners with particular, documented needs and help them to grow and be a part of the integrated classroom. Such inclusion is key in helping to best prepare them with knowledge and understandings to allow them to be successful in both the class itself and in life outside the classroom. For this section, I investigated the more specific question of differentiated instruction, what are effective strategies for meeting the needs of students with autism spectrum disorder (ASD) in the whole, integrated, inclusive classroom?

To begin my investigation, I engaged in research of my own to see what work had already been conducted in this field of differentiated instruction, primarily aimed at supporting students with ASD. I looked at key words such as individualized instruction, children with disabilities, mainstreaming in education and ability grouping, as one area of focus in this group document is ability grouping. One particular focus area was students on the ASD spectrum so specific key phrases in my search included: students with autism spectrum disorder, inclusive classrooms and differentiated instruction approaches. The majority of the articles and studies were explored using databases such as JSTOR, Science Direct and Ebscohost. I read over case studies, quasi experiments and multiple quantitative and qualitative research studies.

During my research, I read over different articles looking to gather a group of studies that focused on different strategies and interventions for supporting students with ASD. Patterns emerged, such as teacher/instructor modeling and role-playing. The use of visual aids, to support comprehension of material and to help students independently transition and be aware of their surroundings, was another strategy supported in the research. These strategies were often implemented in small group settings but the detail in the design of the experiments, the methods for assessing and administering them allowed me to begin to generalize and consider future implication in my own practice. All the strategies explored in these articles presented findings that demonstrate student growth or improvement in performance. As my aim is to see which strategies could be effective for supporting learners with ASD, I examined how and why these were effective and the applicability they had for my own future work in inclusive, general education classrooms.

### **Review of the research**

*Visual aids: structured inquiry and graphic organizers.* Working with students to become more informed citizens through social studies education, particularly government and the history of the world, is a purpose behind the research this article engaged. The National Council for Social Studies (2002) emphasized “the purpose of social studies is to help young people make informed and reasoned decisions for the public good as citizens of a culturally diverse, democratic social in an interdependent world.” Students with ASD can struggle interpreting, processing and understanding the world around them. I find it especially important for students with ASD to understand government so they are aware of what laws and government programs are available and applicable to their lives. It is necessary for this population of students to be well versed in the law so they can be proactive and aware of new measures and ballots that are specific to their condition and well being. According to Schenning, Knight and Spooner (2012) there have only been two studies to date that focus on the effects of teaching social studies content to students with ASD.

The aim of this research was to investigate and study the effects of structured inquiry on comprehension in social studies lessons for students with ASD. In particular, the researchers look at the effectiveness of using graphic organizers to help students with ASD improve such comprehension and problem solving to real world application skills. Supporting research had been done previously in the content area of science. Structured inquiry was shown to improve participation and achievement for students with ASD. My focus is on what are specific strategies that we, as educators, can implement in our general classroom setting to best support learners with ASD. Structured inquiry and explicit instruction are two such methods that can support such an aim. This qualitative study also investigated the effects of the two forms, structured inquiry and a graphic organizer, on students’ ability to generalize problem solving skills to real world applications.

The participants under observation in this study were selected from the teacher researcher. Three students were selected that met the following criteria; had an IQ score of less than 55, enrolled in grades sixth through eighth, ability to communicate through use of vocalizations, augmentative communication or picture symbols, enrolled in the investigators (teacher researcher) classroom of all day support for students with autism and had a consistent attendance record. The researchers looked to measure student comprehension. The text being used was one that was adapted and had pictures or images over key vocabulary words. The teacher read aloud the adapted text while students responded on a graphic organizer that itself contained picture/image cues . The organizer aimed to help students step through the inquiry process for each story. (Schenning, Knight, Spooner, 2012, p. 529) The graphic organizer itself was a flow-chart that contained seven boxes to relate to the seven inquiry based questions asked by the teacher to the students. An eighth box was incorporated for students to respond and explain a connection between the problem in the story to a real world application. It is important to note that the questions were the same for each different chapter, inquiry based. Students were given a point for a correct response, meaning their response aligned with the material and desired objective, and another point if they responded in the correct place on the organizer. A dependent variable in the study was the student’s response to box eight, the real world application. The study worked toward validity through the independent variable it featured; the structured instruction by the teacher. It supports being more valid as a script was used for the teacher to read from, working to ensure the same treatment for each participant.

The teacher first used a model-lead-test to demonstrate how students were to complete the organizer and answer the specific inquiry based questions. Model- lead- test is a method where the teacher demonstrates the desired practice, walks students through their own interpretation and then uses

variables to measure and assess student's independent performance of such practice. For the next step in this quantitative experiment the story was read aloud, with the teacher following the pre-scripted format, and students were given 90seconds to record their answer after each question. This continued through all eight questions. The assessment was conducted at least ten more times. The desired accuracy score was 17/20 and once students achieved this on three consecutive probes they moved on to the maintenance phase.

From this work, the researchers discovered that all the students improved their scores based on their comprehension of social studies content. Participants one and two met the criteria, mastery in three consecutive probes, in five sessions. Participant three met the criteria in four sessions. The study suggests that the organizer benefited the selected students, as they were able to make inferences and draw conclusions from the text, as shown by their work and responses on the organizer. Schenning et. all (2012) noted that the skills were maintained as observed during maintenance.

My focus is on effective strategies for differentiated instruction for students with ASD. These findings suggest that using visual derived materials, such as graphic organizers, can be an effective strategy for supporting such students. What was supportive to the researchers conclusions and findings was the use of the modeling strategy of model-lead-test to help demonstrate to students how to engage such a learning tool. For my own practice, I would want to look to include such explicit instruction to help scaffold this learning for students.

There are several limitations to this study that make it difficult to generalize. One is the few number of participants. The teacher works in a self contained classroom with up to eight students at a time, five of which are diagnosed as on the spectrum. Rather than engage the whole class in this process, the investigator only selected three. Another limitation was the fact that this study was conducted in a self-contained classroom setting. Would these strategies and their effectiveness generalize in a whole, integrated classroom setting? The graphic organizer used was the same one throughout the experiment, I wonder if using the same organizer through the different social studies chapters, which varied on content such as Ancient Rome, Renaissance period to the French Revolution, made for accurate assessment of student comprehension. How do I know if the student just knew how to complete the organizer, as they knew what questions to expect, rather than demonstrate their understanding?

I have been trying to discover specific techniques and strategies to support students with ASD and other learning disabilities. What I can take from this study is the possible effectiveness graphic organizers can have on student performance and comprehension. Students with ASD can benefit from instruction containing visual aids (Gately 2008, National Autism Center). To investigate this further and assess whether these findings are generalizable in a whole group setting I can look to select a wider range of participants to observe. In social studies and English language arts, two content areas I am endorsed in, text plays a dominant role. Inquiry, problem solving and connection to real world scenarios are skills students in these content areas will engage. Graphic organizer and instruction that is model-lead- test are strategies I can look to include in my own practice to support my learners with special needs, especially ASD.

*Visual supports, static images vs. video modeling.* Current research supports the notion that students and individuals with ASD benefit from visual aids and support. The visual supports allow students to “better make sense of their environments, predict scheduled events, comprehend expectations and anticipate changes throughout the day” (Cihak, 2010, p.433). There are different forms of visual support. Static images, or photographs, are one such support while another emerging method is that of video and video modeling. Cihak investigated which visual support method, static picture images or video

modeling, could be more effective for learners with ASD. Both are innovative strategies that I sought out in order to work toward differentiated instruction. Cihak focused the use of visual support on helping students establish routine and transition in the classroom. Research suggests that students with ASD require consistency and regular patterns, thus routines and schedules are specific methods that provide such framework in the classroom (Vaughn, 2007, p. 150). The purpose is to investigate the differential effects of static picture schedules and video modeling schedules for students with ASD during transitions.

In this quantitative experiment, the researcher selected two certified special education teachers that would implement the two visual features in their instruction and daily practice. Four middle school age students were pre-selected by the researcher based on the following criteria: on an individualized education plan (IEP) related to social-behavior skills, did not have any hearing or vision impairments, agreed to participate and had parental consent to participate. Two of the participants attended the same middle school and were in the same classroom. The other two participants had a similar arrangement, attended the same middle school and were in the same class.

Cihak focused on assessing how the students were able to independently transition from one activity to the next using the different visual scheduling method. Each participant underwent ten transitions a day, five using static photo schedule and the other five using a video-modeling schedule. There were five transitions in the morning and five in the afternoon and each participant would undergo one treatment consecutively in the AM then alternate in the PM. For example, participant one would have five static image based activity transitions in the morning and then five video modeling ones in the afternoon. A side note, the photos were of the students themselves depicting the correct and desired behavior, action, and/or movement. The same is said about the video modeling, the videos were of the students themselves displaying the correct method for the specific transition. When it was time for a transition the student underwent the selected method, static picture or video, and needed to correctly, independently transition within five seconds. If not completed within this time frame it would be marked as inappropriate. The participants met criteria when they engaged in 100% independent transitions during three consecutive sessions. The duration of this experiment was over the course of three full weeks of school, sixteen days total.

Cihak (2012) found that the number of independent transitions effectively increased in these participants using both forms of image based activity scheduling. Participants one and two both conducted more independent transitions using static pictures, while participant three had more success with video modeling activity scheduling. Participant four had success with both and analyzing the data it appears there was a slight level of greater achievement with static pictures. Overall, each participant demonstrated much higher levels of independent transitions using these two visually aided activities than their previous, baseline measures.

These findings suggest that these two strategies can be effective practices for supporting students with ASD. At the secondary level, students must transition frequently both in the classroom and between classes- moving from lockers, to classes, to breaks and other organized and timed movements. Looking ahead, it is necessary to analyze what I can do to help students with ASD successfully get where they need to independently, with less teacher or adult assistance. Such independence better equips them for life outside of school and post- school employment (Roessler, Brodin and Johnson 1990).

There are some limitations to this research. This study was conducted in a small, special education specific classroom. I wonder what the generalizability is of such practice in a whole, integrated class. Would a student using pictures and, in particular, videos support the student or distract others, or cause undesired attention? The sample size of this study is limiting as well. The study was conducted at

two different middle schools, could there be greater possibility to include other students in the sample, as the researchers are working with two different populations of students? With more participants there is opportunity to gain further insight as to which method was more effective, static images or video modeling. It is interesting how the students were able to use their own images and see themselves in the video to help them self-assess appropriate transitioning at school. Yet I wonder, in order for these methods to be effective for students with ASD do the images and video need to be of the student themselves? Or can these methods still support such learners using different or unfamiliar images or video? I would have liked to see students use images of others to support this practice further.

I am investigating effective strategies to support students with specific learning disabilities. Having established routines and protocols are practices I can engage in to help provide support for all my learners. These methods can help provide framework and establish consistency in the classroom. Through this study I can see the possible benefits that develop from using images and even video to help establish routines for my learners with ASD. Though this sample was small, it did consist of learners who are at the grade level I am interested in working with. Transition is a big concept in the secondary grade level so I will look to implement such strategies to help learners be self-aware and build the independence they'll need for future experiences.

*Teacher and small group modeling.* One of the difficulties and challenges that students with autism spectrum disorder (ASD) face in their daily, and academic lives, is engaging in and sustaining social interactions and conversations. Dotson, Leaf, Sheldon and Sherman (2009) noted the idea that students with ASD who have fewer friends experience greater psychiatric problems, such as depression. There has been substantial work done to help students develop these skills further through behavior modeling intervention at the individual level, such as one on one intervention. However, not much focus has been on implementing and practicing these behavior skills in a larger, group setting. Dotson (2009) noted the research supporting that a group teaching procedure is effective in teaching conversational skills to developing adolescents. In the classroom group work- from small groups, to partner sharing and even larger group formats, are practices I will engage my students to demonstrate the knowledge and experience that comes from working with others and considering alternate perspectives. As I look at differentiating instruction, I examined what are effective strategies to support learners in such a collaborative environment. The purpose of this study was to determine whether the teaching interaction procedure was effective in teaching three specific conversational skills to students with ASD in a group arrangement. The researchers also looked at the degree to which the skills were generalized to more naturalistic settings with a typical peer, one not diagnosed with a learning disorder.

Research, as mentioned, has suggested the effectiveness of working individually with ASD students on various social skills through methods such as modeling, role-play, scripting and more. What the work here set out to investigate is whether or not this teacher interaction procedure could be generalized to a larger group setting. Six students were chosen to participate yet the research does not specify how they were selected. However, the students had to meet the following criteria: no history of aggressive, severe or disruptive behavior. Observation and parent interviews helped to determine whether or not students met this criterion. Of the six selected, there were two females ages seventeen and eighteen with ASD. There were also three males, two aged seventeen and the other thirteen, who were all also diagnosed with ASD. A fifth participant was a seventeen-year-old male with attention hyperactivity deficit disorder (ADHD). As for the sixth participant, he was part of the control portion of the experiment, as he did not have any disability. The group met twice a week for an hour and a half for each session, totaling three hours per week. The times this group met were after school.

There were three skills the researchers focused on building with this group: conversational basics, providing positive feedback to the speaker, and answering and asking open-ended questions. The dependent variable in this quasi-experiment was the individual performance during three skill-focused probes. The independent measure was the instruction itself. The teacher would spend the first portion of each session, one half an hour, modeling and instructing on the interaction procedure the students would engage in later. The teaching probe started with one student at a time chosen to role-play the skill with one of the undergraduate teachers in front of the group. If they administered this correctly, which was measured by their accuracy at replicating the steps demonstrated by the teacher, the student would move on and another student would have a turn to role-play and demonstrate. If the student did not correctly perform the skill the teacher intervened, provided feedback and the student would attempt the skill again. These sessions would continue until each student had an opportunity to perform the role-play. In order to be considered a master of the particular skill the participants would need to demonstrate three consecutive role-plays with 100% accuracy. One other measure of the study was a generalization probe. As discussed, one participant did not have any documented or observed learning disability. During group down time, where participants engaged in board games or other less formal social activities separate from group instruction, this participant would be prompted by the teacher to engage one of the participants in conversation. The researchers were looking to see the generalization of the skills training, could the students take these strategies and apply them to real life scenarios, such as casual conversation? There were no consequences if participants didn't demonstrate such skill; it was just a measure to check the effectiveness of their training. An important note to understanding this study is how \*Aaron, the participant who engaged the other in conversation, was not given a script or formal instruction on how to engage the students. As for the length of time, this experiment went from February until July of the same calendar year, with the group meeting twice a week.

The findings from this experiment varied as the study looked at two different probes. In regards to the teacher intervention probes, the findings suggest all participants improved in their performance. Four of the five has mastered the first skill of conversational basics. The fifth participant, who did not meet mastery, still demonstrated significant improvement from their prior baseline measure. For the other two skills practiced, giving feedback and answering/asking questions, all five participants met mastery. What these findings demonstrate is the possible effectiveness that small group intervention training can have for students with ASD. Students not only were required to perform the specific skills in front of peers but also had opportunity to watch and learn from such demonstration. They were able to learn from one another, which can be a powerful method as instruction is often teacher demonstrated. As for the generalization probe, there were mixed results. Three of the students showed significant growth in this scenario-based probe. This growth was solely measured on their demonstration of the skills they had practiced in the training sessions. They were measured based on the following criteria: did they respond to questions asked by Aaron, the control participant? And, did they engage in conversation with him? meaning they exchanged with more than one response. For two of the students their results were mixed. It is interesting to note that these two students, who showed inconsistency with the generalization probe, were the two females in the group. These findings suggest how effective a group like setting as this can be for teaching students with ASD social skills. What is beneficial is the experience the students receive seeing each other engage in the role-play.

Though the study had positive results for the participants, there are several limitations to take into consideration when assessing the validity of the outcomes. The students witnessed the teacher model the desired skill, and then the student role-played accordingly. This mimic-recall like practice makes it

difficult to assess how to naturally transfer such skills. The context is not a natural scenario, so how can we expect students to engage this in a more naturalistic setting, such as the classroom? This issue of validity is addressed through the generalization probe. However, this probe itself is limiting. The student was in charge of approaching the other participants to initiate conversation, allowing students to practice the skills learned in-group setting in a real life scenario. However, how the control student, the one with no documented disability, approached the participants was not scripted. He received no formal training and it is not recorded who he approached, how many times he approached the different participants and the method he used to engage them. This control participant was male and as mentioned earlier the two participants who showed inconsistent results from this probe were the only two females of the group. This made me consider gender, is it more difficult for students with ASD to engage in conversation with those who identify as a gender different from them? These findings would indicate as such. This leads me to another limitation, the sample size. Though there were more participants, six total, than previous studies included in our research work this is still a significantly small number to accurately represent the students with ASD population. Also, it is too small a sample to draw inferences on the idea of gender and whether students with ASD have difficulty socializing with those who identify as a gender different from their own. Finally, this was done outside of school instruction time. What I would need to consider is the practicality of hosting such an after school activity. I would have to consider, first the participants, how could they get home after the program, since some of the students are too young to drive and those who are of age it is not certain whether they have transportation. As a first year teacher, I would need to consider time management for myself and the responsibilities that come with teaching, as well as personal care (to avoid burnout). Also, students have varied and busy lives outside of school. Though parent approval was needed to part take in this study, it may be difficult to implement a program that all students could participate in that wouldn't interfere or conflict with any other engagements the student or family may have.

What I take from this study is the strategy of small group- teacher interaction procedure to help students with ASD develop social skills that allow them to communicate and engage conversation with others. Though it is difficult to generalize the findings from this study, due to the number of limitations, what I can take is the possible effectiveness of teacher modeling a desired skill or behavior. To help students with ASD who are challenged by social interactions in the classroom I can look to model the expected behaviors the activity or specific lesson would require. I would look to further investigate what specific practices to model for students to help them develop these crucial social skills.

*Small group modeling- in natural settings.* As the previous annotation explored, students with ASD struggle with social interactions. Not only is it difficult for students to engage, participate and maintain conversations verbally but also they struggle with non-verbal behaviors associated with conversation. Such examples of these non-verbal conversational behaviors include making eye contact, creating some physical space between the two engaged in conversation, and body movement and gestures. Research inferred the importance for students with ASD to develop more typical conversation skills to help them navigate and pursue more independent social encounters in the real world such as employment, higher education and independent living (Nuernberger et. all 2012). The researchers noted the limitations that previous research had in helping students develop such social skills, in particular the lack of demonstration of these skills in a natural setting or environment. This was even a limitation in the previous two studies I reviewed. This research aimed towards more naturalistic methods by looking to provide support for students with ASD in both the verbal and non-verbal behaviors for social interaction. I want to determine what strategies are most effective for these learners to implement in my own practice.

Strategies aimed at a more natural approach are most desirable as they are more generalizable to both classroom interactions and student's own real world experience. The purpose behind this quantitative study was to examine the result of using the strategy of role-play training to teach vocal and non-vocal conversational skills to individuals with ASD.

The study was a quasi-experiment as the participants were specifically referred by their case managers. Three young adults with ASD, two males and one female, were the selected participants who were not only referred but gave their consent as well. All three were residents in the same rehabilitation facility that provided vocational, transitional and behavioral services to individuals with developmental and/or physical disabilities (Nuernberger et. al. 2012). To support my research question I looked at the ability to generalize these findings as they seek to implement a behavior skills training focused on skills implemented in a natural approach.

The method for this quantitative study involved one participant at a time working in an isolated room, away from other participants and others in the rehab facility, with one of the selected therapists. The therapist, using a pre-written document to read from, gave instructions, modeled and rehearsed with the participant the desired skill. The task the student would conduct was also written on a document and handed to the participant to read aloud. To provide further visual support, two experimenters whose background is not specified in the study, acted out and role-played the desired skill. The young adult participant rehearsed with the experiments, while the therapist observed. The therapist observed and assessed whether the participant engaged in all the steps depicted in the handout, followed the instructions by the therapist and later enacted by the two experimenters in their role-play rehearsal. If 100% accuracy was not reached at the end of the rehearsal the participant would receive feedback, then repeat the practice over again. There was one more measure to this experiment. Once a participant demonstrated with 100% accuracy the desired skill they would then return to the group living situation and engage in what the researched abbreviated SITU, situational training. This form of training asked for the participant to engage in conversation with a peer, randomly selected by the experimenter, using the skills previously rehearsed. Again, the measurement and criteria for students to master, or move on to maintenance, was based on the participant's demonstration of the steps. The ten steps, which remained the same during each task, were; stand/sit at least an arm's length away, look at the other person's face, say greeting, ask a question related to an appropriate topic, wait appropriately for the other person to respond, make a statement or ask a question related to the same topic, wait appropriately for the person to respond, make a statement or ask a question in response to the same topic, wait appropriately for other person to respond and, finally, end the conversation when interest is lost or the other person ends the conversation (Nuernberger et. al. 2012). These sessions, which each participant engaged in anywhere from one to four a day, were done over the time frame of four weeks.

The follow up, after the four week experiment period, lasted anywhere between seven to ten weeks. Following these time parameters, the findings suggest that all three participants showed significant improvement in their social interactions with peers. The percentage of correct steps, from the ten mentioned above, continued to increase in accuracy during the maintenance phases, weeks seven to 10. What these findings highlight is the possible practicality of training students with ASD methods that facilitate more natural social interaction. The steps these participants engaged in were not just about how to communicate verbally in a social interaction but how to properly interact non-verbally as well.

There are, however, several limitations to this particular study that make it difficult to generalize. I am interested in working with youth at the secondary grade level, which are students between the ages of ten and eighteen. The participants in this study were older than this desired age range, falling between

the ages of nineteen and twenty-three. These participants also reside in a rehabilitation facility; how long they have each resided there is not stated or mentioned. The duration for which they have resided there can make an impact on the familiarity the participant has with their surroundings. If they feel comfortable in their surroundings does that support their ability to engage in conversation or is it solely the training itself? When engaging in discussion with peers at the facility it is difficult to gauge the authenticity of such conversation as I do not know whether or not the participant and those they engage in conversation with have any prior history or experience conversing together. Also, the research does not state what the topics of conversation are that the participants engage others in. It is mentioned how the topics are created by the participants themselves, yet did they discuss the same topic over and over again or was it something different? I would like to investigate this further so I can assess whether it is the training there are receiving that is supporting their growth in social interaction or are they merely repeating the same conversation, the steps, yet on different individuals in the facility. Another limitation is the small selected size of participants. Only three were put under focus for this specified training and in a specific setting. This setting was one not conducted at a school or in an educational setting. It is not specified if the experimenters or therapists have any teaching or education background.

There were several limiting factors for generalization in this experiment. As an educator, I am seeking out different strategies to support students with ASD in the general education classrooms. Insights I gained from this experiment were the steps implemented to help students engage in more natural conversation through non-vocal behavior and mannerisms. Other research I have seen done in school settings focused primarily on the communication and vocal training for maintaining conversations. However, what I learned is the possible significance and effectiveness that can stem from teaching, through demonstration and rehearsal, non-verbal behaviors to students with ASD. I would look to further investigate other methods for implementing these skills to my learners, to allow them to be more naturally engaged in social interactions, as research has shown is critical to their growth and ability to lead successful, independent lives outside of school.

*The inclusive classroom.* These quantitative studies I have examined thus far provide some insight into different strategies for supporting students with ASD. Yet one important strategy I can include in my practice is being knowledgeable of the learning disability itself, especially in order to assess what strategies are effective or not. In this study conducted by Segall and Campbell (2012), they aimed to assess the experience, knowledge, attitudes and current practices of education professionals on this very disorder.

There are many attitudes and varied understandings regarding this learning disability. Again, my overall focus is on effective methods to include in my practice to support learners with ASD in the general, inclusive classroom. There is a growing trend of schools looking to support students with ASD by including them in more whole, integrated classrooms rather than pullout, one on one special education classes. There are contrasting arguments to this inclusive educational approach. This study looks to gauge what exactly are the understandings and attitudes surrounding both inclusion of students with ASD and professional educators knowledge and familiarity of this particular disorder. As Segall and Campbell (2012) stated their purpose behind this quasi-experimental study is to assess educational professionals backgrounds, perspectives and prior experience working with students with ASD, their knowledge of the disorder itself, attitudes towards inclusive education and classroom practices. A second purpose was to also examine school psychologists and their knowledge and attitudes towards inclusion for students with ASD in general classroom settings.

The method in which the researchers looked to explore these aims was through a questionnaire

they created and administered to over forty-five schools in the state of Georgia. Thirty-three schools were represented in the one hundred and ninety six questionnaires that were returned. Of those one hundred and ninety six, thirty-nine were completed by administrators, fifty-three were done by general education teachers, seventy-one responses were from special education teachers and thirty-three were completed by school psychologists. Of the total sample, eighty-four identified as female and ninety-one were Caucasian. The questionnaire itself was comprised of five sections. One section was multiple choice on different facts revolving around ASD. Section two was comprised of fifteen questions where respondents answered true or false on their knowledge of the disability itself and some notions surrounding it. Section three had eleven questions where participants rated from strongly agree to strongly disagree their opinions on various statements regarding inclusion of students with ASD in the general education classroom. A fourth section asked participants to rate on a scale from highly disruptive to none at all on twenty different behaviors typical of students with ASD. In the fifth and final section, participants were given a list of thirty-seven different strategies and asked to share whether they had heard of the strategy, used it and/or if they felt it could be effective for supporting such learners. The questionnaire sought out a wide variety of information and used a particular measure to score the data they received from these prompts. The only two sections that were given scores for were section two, focused on total experience, and section five, the different classroom strategies teachers either implemented, had heard of and/or had not heard of before. In section two there was criteria as to what were correct answers. This information is not included in the study. As for section five, the score given was the sum of the number of strategies the participant had awareness of and the sum of the strategies they indicated they had prior or current use in their own practice. To help me learn what strategies currently exist, it would have been beneficial to see the questionnaire itself and what ones were mentioned on it.

Various schools across Georgia received this questionnaire. Administrators were in charge of handing them out to who they considered to be appropriate personnel. For each county that participated, the researchers contacted their department of special education and provided them with study materials to help with completion of the survey. Also, four participants were selected at random to receive a small monetary incentive for completing the questionnaire. How the random four were selected, what randomized selection method, is not mentioned. These measures, contacting departments, offering incentives are areas to consider when looking to collect data and receive immediate feedback.

Of the one hundred and ninety six responses from different educational professionals were a variety of different responses. Overall, the findings conclude there were positive, favorable attitudes towards inclusive education for students with ASD, which is consistent with previous research, conducted looking at this similar issue (Campbell and Segall 2012). Looking at sections one and two that centered on knowledge of the disorder itself, general education teachers and administrators scored similarly. Also these two groups were similar, they both scored lower than special education teachers in this very category. For section five, the other section measured, special education teachers and school psychologists had similar scores, which were both significantly higher than both general education teacher responses and administrators answers. What is interesting to note is that of the four groups of educational professionals, general education teachers reported the least positive attitudes towards inclusion of students with ASD in the classroom. This suggests to me there is still some hesitation, reluctance and/or uncertainty general education teachers have regarding inclusion, all the more need for continued education and development as to effective measures and strategies to support such learners.

This study was conducted in the state of Georgia. It is difficult to generalize these findings as there is no explanation as to how schools were selected to participate. It is mentioned that the researchers

contacted the department of special education for each county that participated and sent study materials. What were these study materials? How were they used and how did administrators decide how to hand out materials? These questions cannot be answered based on the information in the study. If I were to implement such an investigation I would need to uncover such information to see if they were either helpful to the participants and/or helped promote a response or completed questionnaire. School administrators were in charge of selecting which personnel were to receive and fill out the questionnaire. There is no mention of criteria or method in which administrators went about selecting whom could participate in this study. It is difficult to generalize these findings to my own specific focus area of secondary education as there is no explanation or discussion as to the grade and content level and/or experience of those who participated and completed the questionnaire. As my research question is aimed at uncovering effective strategies for supporting students with ASD in my classroom, to better support this analysis I would need to examine the thirty-seven strategies listed in the questionnaire. Again, I do not have any information or a copy of the questionnaire so it is difficult to generalize or investigate further. The setting for this study is in the state of Georgia. Though this a larger format for such a survey it is still limiting as it is only one state. The study could have been more valid had other areas or regions been included in the survey. Validity would have increased as there would be different systems, schools impacted by different state laws, in which to compare results to. The questionnaire itself causes limitations as the questioning methods didn't allow for much open-ended or free write response from the participants. Formats included true/false, multiple choice and likert-type style questions where responses were limited.

What I can gather from this study is the varied levels of understanding, knowledge, and practice amongst educational professionals in regards to the disability of ASD. To explore this investigation further I would look to construct a new questionnaire, one that allowed for more open ended responses or space for feedback from the teacher to more accurately express their understanding as well as what they hope to learn. I also feel, in order to get a better sense of classroom climate and culture, that students themselves could be included in such a survey. Their input could provide more authentic insight as to the attitudes and understandings of not only inclusion of students with ASD in the general class but the disability itself. From this I could see the next steps to take in order to make such inclusion possible and effective for all learners in the class.

**Summary of findings and future implications.** A value I strive toward as an educator is that of working to provide equitable opportunities and access to learning for all my students. This is why I chose to focus in on differentiated instruction; exploring ways I can adjust my practice and include effective strategies to support my learners with various needs. One such need in particular I have looked to center my research on is students with ASD. Through my research I have begun to educate myself on this disorder and the challenges that students with ASD could potentially face in the school, and even outside of school setting. In the articles I have analyzed I was able to investigate and uncover different strategies teachers, experimenters and researchers have implemented and practiced specifically for students with this disorder which suggest, from their varied findings, their effectiveness for these learners.

Patterns emerged in the research and one such commonality, that pertains to my question aimed at effective strategies for learners with ASD, was the impact that teacher led modeling had on such learners. In four of the studies I noticed how teachers and/or researchers used some form of this explicit instruction, where a specific skill was being focused on, and first demonstrated by the teacher/researcher/experimenter who had experience using this skill. The findings suggest how this strategy supported students as it created an opportunity to enhance their ability to better visualize this

skill, and in turn to replicate it themselves. Another effective strategy supported students with ASD by providing visual aids and representations. Prior research discussed how students with ASD could potentially improve their ability to comprehend and make sense of their surroundings when such visually aided practices are implemented (Schenning et. al 2012).

My aim was the implication and effectiveness of strategies in the whole, inclusive general education classroom. These studies and experiments were all, with the exception of the last study discussed, done in self-contained or small group classrooms. The authors and researchers do not discuss in great detail the applicability or generalization of their strategic work to a whole, large classroom format. However, as mentioned, more and more schools are working towards more inclusive classrooms where students with ASD will be members of. In these studies the independent variables were teacher based, for example duration of observation, scripted, consistent prompting and questioning. Being teacher or instructor based, I can look to replicate these experiments in my own practice and measure their possible effectiveness based on my own student population.

From the final article reviewed in this section of work I was able to get a small glimpse into some of the attitudes, understandings and knowledge on ASD by educational professionals. Inclusive classrooms will be a constant discussion in the educational realm. As mentioned, general education teachers were the ones who reported the least favorable attitudes towards such inclusion. An implication for future practice is that by expanding my own knowledge on this disorder and engaging colleagues to seek out educational opportunities can work to help widen perspectives and increase understanding for learners who struggle with this condition. Also, being informed can be a method to authentically and effectively meet the varying needs of students with ASD. I'd like to investigate further the correlation between awareness and knowledge on this disorder and practicality of teachers, and other educational professionals, implementing and advocating for inclusion. One of the challenges of differentiated instruction my colleagues and I discuss is the gap between research of effective strategies and the likelihood of teachers implementing them in their own practice. Engaging in my own experiments and seeking out opportunities for further knowledge can be ways to help contribute to the literature and research available and possibly help bridge this gap. In doing so, I can make a concentrated effort to better serve my students who require special support, such as our learners with ASD.

## **Learning Disabilities and Literacy: Strategies to Support Student Learning and Confidence** **By Jessica Cohoe**

**Introduction.** As general education teachers, our goal is to support students with specific learning needs through differentiated instruction. Students with special needs frequently struggle with literacy in the general education classroom. What strategies can general education teachers use to increase both the skills and the confidence of students who qualify for special education services in reading and written expression? In this section of the paper, I will focus specifically on students who need additional reading and writing support because of a learning disability (LD), and on specific strategies that teachers can help students employ to increase their skills in literacy and their confidence in themselves as readers and writers for the rest of their academic career.

As I have continued the process of becoming a professional educator, all the general education classrooms I have taught in have included students with IEPs who often need support in reading and writing. Unfortunately, I have not felt successful in providing what those students need for them to be

successful academically in literacy. In my student teaching, I have seen students struggle to finish in class readings, which limits their ability to fully participate in pair or larger group discussions. I have seen both panic and complete disinterest in the eyes of students as they sit looking at text. I have received paragraphs consisting of two sentences. As an educator, I wanted to increase my skill in supporting these students.

I chose to focus on both reading and writing because they are interrelated processes which should not be focused on in isolation (Langer & Flihan, 2000). Becoming stronger readers will make students stronger writers, and vice-versa. The task of reading, especially as students transition to secondary school and start reading more and more expository text, is particularly challenging for students with learning disabilities (DiCecco & Gleason, 2002). When they read, they consistently have trouble with comprehension, identifying text structures, making inner-textual connections, and using and transferring effective reading strategies (DiCecco & Gleason, 2002; Jitendra, Hoppes, & Xin, 2000; Johnson, Graham, & Harris, 1997). In secondary school, teachers increase expectations for complex writing as well. Students with learning disabilities can grow to hate the writing process, and they can struggle with using effective strategies and supports to create quality written work (Hallenbeck, 2002; Sturm & Rankin-Erickson, 2002). A significant concern is that not only are these students struggling to read and write, but they are also losing confidence in themselves as learners and as experts in school (DiCecco & Gleason, 2002; Hallenbeck, 2002; Sturm & Rankin-Erickson, 2002). Therefore I wanted to focus on using strategies that will increase not only the ability of students with learning disabilities to read and write effectively, but also their confidence and ownership of learning as they read and write.

I began my research by searching for studies via EBSCOHost, a large academic internet database. I searched with several combinations, while always ensuring that I was only looking at peer reviewed articles from 1990 to the present. The combinations of: 1) “differentiated instruction,” “reading,” “writing,” and “special education” and 2) “literacy,” differentiated instruction,” and “secondary” yielded too few results. With the search terms of “differentiated instruction,” “literacy,” and “special education,” I was able to find a helpful and recent literature synthesis (Kim, Linan-Thompson, & Misquitta, 2012). From that synthesis I began to find research articles and literature reviews, and eventually I located five studies that were connected to my research question. One limitation is that all the studies were conducted in special education classrooms. There were none that showed a general education teacher differentiating the strategies for students with learning disabilities in the general education classroom. So before I finalized what studies to analyze, I tried a few more searches on EBSCOHost. I used:

- “Reading or writing,” “differentiated instruction,” & “inclusive”
- “Reading or writing,” “differentiated instruction,” and “strategies”
- “Reading or writing,” “differentiated instruction,” and “learning disabilities”
- “Reading or writing,” “differentiated instruction,” “learning disabilities,” and “secondary students”

The results from these searches were extensive but the content did not match my research question well. So I decided to use the five articles that I found using the research synthesis. Despite being limited to special education settings, I read and analyzed the articles with the lens of applying the strategies through differentiated instruction in a general education classroom. Three articles focused on reading narrative or expository text, and two articles focused on expository writing. Using these search terms and strategies I also mainly found quantitative research. As I continue to explore supporting students with learning disabilities through differentiated instruction, I want to search for more qualitative studies. Since differentiated instruction focuses on meeting the individual learner where they are, there could be value in

reading more qualitative studies that focus on individuals' experiences with reading and writing, instead of focusing on treatments for students. From the research I read, it seemed that introducing strategies to students, whether students used them on the posttests or not, increased their reading and writing skills. There is less evidence about whether or not those strategies increase students' confidence in literacy. From these studies, I noticed areas where I could engage in additional research. I also noticed patterns across articles, and decided on some strategies to implement in the classroom.

### **Review of the research.**

***Strategies to support reading.*** For students to be successful readers, they need to comprehend what they are reading. In one quantitative study, Johnson et al. (1997) wanted to examine two components – self-instruction and goal setting – of the self-regulated strategy development (SRSD) method and analyze how they affected learning a reading comprehension strategy (story grammar) for students with learning disabilities. The researchers hypothesized that not only would self-instruction and goal setting improve students' ability to comprehend a story, but students would also be able to recall story details similar to a group of average readers. To test their hypothesis, Johnson et al. created an experimental study. They conducted their experiment in four suburban elementary schools in the Washington, D.C. area. A total of 47 students in 4<sup>th</sup>, 5<sup>th</sup>, and 6<sup>th</sup> grades participated in the full study. To ensure similar skill levels amongst participants, Johnson et al. purposely sampled students who met established criteria, including qualifying for special education services because of a learning disability.

The researchers randomly assigned students to four different types of instructional groups: strategy condition (story grammar); strategy plus goal setting; strategy plus self-instruction; and strategy plus goal setting and self-instruction. In addition, there was a group of 12 normally performing students who were given a test similar to one of the posttests used with the experimental groups. After receiving extensive training, five graduate students worked with one or two instructional groups that consisted of two to three students. To ensure fidelity, they all kept a detailed copy of the study's lesson plans, logging and checking off the elements of the lesson. The instructors met with the students in a quiet area at their schools for about 45 minutes, two to three times a week, for four to six weeks. Instructors emphasized collaboration, active learning, and student responsibility for applying strategies. Instructors also gave students consistent and tailored feedback. The total amount of instructional time varied because the instructors introduced each new lesson only after the students had mastered the previous one. Although the time difference between types of instructional groups was significant, the posttest scores show no significant variance on scores related to instructional time.

The lesson sequence involved multiple steps. Instructors began by teaching all groups the common parts of a story. The next step was introducing the concept of reading strategies and explaining how they help people do better and understand more. For instructional groups with goal setting, the instructors introduced the strategy at this time, with a focus on performance goals. For the next lesson, instructors taught the four parts of the story grammar strategy to all groups: "write and say story parts, read and think, remember and write, look back and check" (p. 85). For instructional groups with the goal setting components, instructors now explained how to set a performance goal related to the strategy. At this point, instructors also introduced self-statements for groups incorporating self-instruction. These were statements that students could say to themselves about multiple aspects of reading, including problem-solving, planning, and reinforcement. Students generated several self-statements during these sessions. For the next step, instructors modeled using the story grammar strategy for all groups, as well as using the other strategies (goal setting and self-instruction) for the appropriate groups. The final sequence focused on all instructional groups memorizing the strategy steps and doing collaborative and

independent practice. For each of these steps, groups that had a focus on goal setting or self-instruction incorporated those strategies as well.

The researchers used two kinds of testing to measure students' reading comprehension. The instructors administered three of them, a pretest before the start of instruction, a posttest immediately following instruction, and a maintenance test 4 weeks after instruction ended. These tests employed a retelling format. Students would read a story and instructors would assess the amount of information they were able to recall immediately afterward. When students had finished telling all they could, instructors asked them if they could remember anything else. Instructors framed the follow up questions to ensure that they gave no additional information to the students. The instructors tape-recorded the story retelling and filled out a checklist as the students shared. They calculated scores based on main ideas, details, and recall of the eight story grammar parts: "characters, time, location, problem, goal, events, ending, and reactions" (Johnson et al., 1997, p. 83). The students' resource room teachers also administered a multiple-choice pretest and posttest on the eight parts of story grammar. The purpose of this test was to see general results across students and settings.

From the data collected on these tests, all students performed significantly better on the posttests than pretests in all measurement areas (main ideas, details, and story grammar). However, no significant difference existed between the instructional groups, indicating that teaching students goal setting and self-instruction did not change their performance on any of the posttests. While other benefits may have emerged from these strategies, Johnson et al. only defined and measured reading comprehension. The researchers also gave a version of the retelling posttest to a group of normally achieving students. These tests showed no significant difference between the scores of the normally achieving students and the experimental students. So after receiving the story grammar instruction, students with LD were able to recall story details at the same level as their normally achieving peers.

During the posttests, researchers also recorded if students used the story grammar strategy, self-instruction, or goal setting based on student written or verbal evidence. Only one student overtly used all of the story grammar steps on the posttest, and none of the students overtly used all of them on the maintenance posttest. Between 30-38% of the students trained in self-instruction and/or goal setting overtly used the strategy on the posttest. On the maintenance posttest that number fell to 21%. Johnson et al. gave several possible explanations for why students did not overtly use these self-monitoring strategies and why there was lack of difference between instructional groups. First, through learning the story grammar strategy, students might have learned more implicit self-monitoring strategies than the explicit ones of goal setting and self-instruction. Second, once students were confident in the story grammar strategy, there may have been less of a need for the self-monitoring strategies. Third, some of the variables involved in teaching, like collaboration and feedback, might have reduced the need for the specific self-monitoring strategies. Finally, since the story grammar structure was demanding for the students, they might not have been able to give any extra cognitive attention to the self-monitoring strategies.

One significant difficulty with generalizing this study is the lack of description on the strategy instruction used. Johnson et al. draw heavily from a previous study (Bednarczyk as quoted in Johnson et al.) and use the story grammar parts and strategy steps without explaining them. Another critical analysis of Bednarczyk would yield more results on generalizability. Johnson et al. gave a more descriptive treatment of the self-monitoring strategies, but those strategies showed no significant difference in the results. In describing their findings, the authors pointed out that the novelty of the treatment and the Hawthorne effect (students perform better because of special attention) could have affected the results.

They pulled from multiple studies that have been similar to theirs that accounted for both of those threats to generalizability to substantiate the external validity of their results.

Many confounding variables were accounted for in this research design, including history, maturation, and statistical regression. However, the researchers could have strengthened the internal validity of the experiment by including a control group. Since all the students learned about story grammar and they all performed statistically the same on posttests, the initial assumption was that story grammar improved their reading comprehension. However, if there was a control group that did not learn about story grammar but also performed at the same level as the experimental groups, then the researchers would need to examine what variable affected the results. They did state that the school system did not allow that arrangement for ethical reasons. Although Johnson et al. maintain that the students who did not complete the study dropped out in a pattern that is similar to the overall demographics of the students, it is important to note that one student dropped out because he or she did not want to work with younger students (along the 4<sup>th</sup>-6<sup>th</sup> grade spectrum). Since the researchers were focused on strategies that depended on collaboration between students, this issue is an important one to attend to. If students resist working with each other, teachers need to be able to address that issue so it does not affect the results in the classroom, where students cannot drop out in the same way as in the experiment.

To ensure the reliability of the experiment, Johnson et al. did extensive training and collected follow up data to ensure treatment fidelity between the five instructors. For the retelling tests, instructors practiced on a group of normally performing second graders until their ability to ask questions without giving away information was satisfactory. For the multiple-choice tests, researchers administered them to a group of normally performing second grade students and made adjustments based on student responses before giving the tests to the experimental group. Two independent scorers graded all tests (both retelling and multiple-choice).

Based on this analysis, I would be hesitant to use these strategies in my classroom to improve students' reading skills. First, the strategy that seemed to have the most effect (story grammar) is not explained in sufficient detail. Second, the strategies that would seem to lead to increased student confidence (self-instruction and goal setting) showed no significant effect. Because of this analysis, I would want to examine the original study that Johnson et al. were drawing from to determine if the story grammar is a strategy worth trying in the classroom. I am also curious about the connections made by the researchers between reading comprehension and recall of details, main ideas, and story grammar parts in the posttests. I anticipate that in my classroom I will rarely ask students for factual recall from text without providing the opportunity to look back at it. I am informed by what McKenna & Robinson (2006) called the levels of comprehension. They pushed for comprehension that goes beyond literal restatement of facts and focused on inferential (identifying unstated facts) and critical (making value judgments) comprehension. I wonder about what strategies will help students with LD read for deeper comprehension.

Another aspect of reading comprehension is being able to identify the main idea in a passage. Jitendra et al.'s (2000) main research question focused on the effect of using both a main idea strategy instruction and a self-monitoring procedure with students with learning and behavioral disabilities. The researchers also investigated how students could generalize the strategies learned during the initial portion of the study to texts that were similar to the instructional texts, as well as narrative and expository passages. To answer this question, the researchers did a pretest/posttest control group experimental study in an urban school district in the northeastern United States. The researchers do not indicate how they identified the school, but they were intentional about how they chose students for the study. From four

resource rooms, 33 middle school students completed the experiment. All students had to qualify for special education services in reading at the time of the study. The researchers purposely sampled students by looking at their scores on the Woodcock Reading Mastery Test to ensure that students struggled with reading comprehension but not decoding. Researchers stratified students by grade level (6<sup>th</sup>, 7<sup>th</sup>, and 8<sup>th</sup>) and then randomly assigned them to either a control group or an experimental group.

One of the researchers (a doctoral student in special education) taught the experimental group in the school cafeteria. She would give instruction to small groups of 6-8 students for 30-40 minutes during their normal reading resource time. She gave instruction on 8 lessons over 15 days. The first two lessons focused on generating main idea sentences by naming a subject and stating the main thing the subject did. The next lesson focused on identifying a main idea statement of a passage from four multiple-choice options. In lesson 4, students had to read passages with a distractor sentence – one that did not connect with the main idea – and then identify the distractor and generate or select a main idea sentence. The final four lessons guided students in generating or identifying more complex main ideas by identifying and describing *where*, *when*, *why*, and *how*. Throughout the lessons, the instructor incorporated a self-monitoring strategy that used a card with specific steps for students to check off. The steps were read the passage, use prompt card to help with strategy recall, apply strategy to understanding the main idea, and identify or write the main idea. A trained observer watched and scored the instructor for fidelity to the developed teaching script for about 33% of the time. Four regular resource room teachers taught the students in the control group, focusing on decoding and comprehension. No observers watched their classrooms.

To measure growth, Jitendra et al. created three tests – a pretest, posttest, and delayed posttest. The researchers divided the test items evenly between two types of questions (multiple choice and written response) and three types of passages. The first was the training passage, which was similar to the instructional passage and explicitly included a main idea. The second type was the near transfer passage from a basal reader. This type of passage was similar to the instructional text, but often had an implicit main idea. The last type was a far transfer passage from a middle school social studies textbook. This passage was a different type of text than the instructional passages and it often contained an implicit main idea. The researcher/instructor administered all the tests to both groups throughout the experiment. She gave the pretest the day before instruction began, the posttest the day after instruction ended, and the delayed posttest 6 weeks after instruction ended.

Because of the multiple variables in testing (two groups, three tests, two types of responses, three levels of transfer), the researchers analyzed the results in multiple ways. Looking at just the time of the test and the experimental and control group, the researchers found that students in the experimental group performed significantly better on the posttest than the pretest and significantly better than the control group on posttests. However the experimental group's scores on the delayed posttest were significantly lower than the posttest. The control group showed no significant difference between pretest and posttest, and a significant improvement from posttest to delayed posttest. A possible explanation for these scores is that students in the experimental group did not use the strategies as effectively on the posttest, but students in the control group benefited from the additional six weeks of instruction on the delayed posttest. However, the experimental group still performed significantly better on the delayed posttest than the control group, which indicated that there was a learning benefit to using the reading strategy. To analyze the variables in the tests, Jitendra et al. analyzed the effect of types of question (selection vs. production) and types of transfer (training, near, and far), and the two groups (control and experimental). They did this three times for each of the tests. For both groups on the training, near transfer, and far transfer

passages, all students performed significantly better on selection items than production items. For training passages, the experimental group performed significantly better on selection response items than the control group, but showed no significant difference between groups for production response items. On the near transfer passages, the experimental group performed significantly better than the control group in both types of responses in the two posttests. Finally, for the far transfer passages, the experimental group showed significant improvement from pretest to posttest, while the control group exhibited no significant change across tests. In other words, by the end of the study students in the experimental group were better at identifying the main idea from a passage than the control group. However, all students performed better on selection response questions than production response questions. Based on these results, students were more proficient at selecting the main idea from multiple choices, rather than producing the main idea through writing regardless of instructional condition or type of transfer passage. Although the delayed posttest results were not as positive, the authors maintained that a summarization strategy and self-monitoring tool could be a simple and effective strategy to incorporate in the classroom.

Jitendra et al. gave limitations to their study, starting with testing. Based on the data, students across all groups were able to perform better on selection responses rather than production responses. The authors gave several reasons. First, with selection responses, there was a greater chance that students were able to guess the right answer, and the authors did not account for this issue. Second, students might have struggled with the writing, not the main idea comprehension, for the written responses. The researchers accounted for this in some measure by only grading for the main idea, ignoring syntax and spelling. Other issues with the tests included their length (36 questions), which could have been daunting to struggling readers; students' inconsistent performance based on the level of transfer and type of writing; and a lack of comparison of the difficulty of the test with average readers. All of these testing issues may have affected the reliability of the experiment. Jitendra et al. also cautioned on a concrete interpretation of the test scores, since the attrition rate was greater for the control group than the treatment group. In the end, the control group had less females, less sixth graders, and less Caucasian students than the experimental group. This change in group demographics might have affected the results based on how each of those groups (females, sixth graders, and Caucasians) performed on the posttests in general. Since there was no data from the experiment regarding this issue it is impossible to know for certain if these demographics had a significant effect. Finally, the study did not examine the effects of this strategy when used with other main idea comprehension strategies or when used in the general education classroom, affecting how general education teachers may generalize the findings. In addition to the authors' identified cautions, it would be helpful to know more about what the resource room teachers were doing with the control group to ensure there were not other variables that affected the results.

With these cautions, the experiment had some strengths. The design of the study accounted for many of the confounding variables that could have hindered internal validity. To ensure the reliability of the testing, a graduate student completed each of the tests to validate the answer key created by the second researcher. To score the tests, the second researcher and a graduate student not involved in the treatment discussion graded the tests, with an agreement of 98.1%.

As an educator, I want to know what strategies I can teach students that will help them as they read. Based solely on the results of this study, I am not certain that it is the main idea comprehension and the self-monitoring strategies that resulted in the higher scores for the experimental group. I would want to know more about what the resource room teachers were doing. Another concern is the higher performance on selection response than production response for *all* students. I want students to be able to

produce knowledge, not just identify it. I would appreciate more measurements of students producing the main idea of a passage, preferably verbally, so writing does not limit their ability to show their learning.

However, the strategy of giving students a reading checklist is an approach I would want to try in my classroom, even if I am not convinced that I would have the same results. Part of my reasoning is that students with LD often have difficulty applying appropriate reading strategies (Mastropieri et al., 2001), and this could be one way to give students a tool to use as they read. It seems like I could teach the strategy in a readers' workshop or a small group mini lesson. Since the strategy is not limited to a set curriculum, it can also be applied across content areas to unmodified texts. As I implement it, I would want to examine how it affects the comprehension of those students. Are they able to talk about the reading in new ways? Since I am also concerned with readers growing in their confidence, I would need to attend to how the strategy affected students' attitudes towards reading, either through exit tasks, a survey, or a conversation.

From reading this study, I am curious to know more about other strategies that aim to improve the main idea comprehension of students with learning disabilities. Are there more studies that confirm or extend this one and that account for some of the variables that may have affected the results? Since the researchers taught the strategies using fictional passages and then asked students to transfer the strategy to expository text, I want to know if that is the best way to teach for transfer and to teach students how to identify the main idea of expository passages.

Not only do students have to comprehend and identify the main idea in texts, they should also be able to make inter-textual connections. DiCecco and Gleason (2002) wanted to find out if using graphic organizers (GOs) can help middle school students with learning disabilities grasp relational knowledge from text. The researchers used an experimental pretest/posttest control group and conducted the experiment in two middle schools in Oregon. One was located in a low socioeconomic status neighborhood (SES) and the second was from a middle SES neighborhood. The researchers did not indicate how the schools were initially selected, but the 24 students who finished the study had to fulfill certain criteria. Each student had to be identified as having a LD (according to Oregon state laws), participate in special education programs, have an individualized education plan (IEP) in reading, and have parental permission. From this purposefully sampled group, the researchers randomly assigned students to the control group and the experimental (GO) group. Each group had 12 students with a mean age of 13.5 years. Both groups were comprised primarily of white males.

To ensure that the groups were equal in skill levels, the researchers administered four different tests. The first two were several subtests from the *Woodcock Reading Mastery Test-Revised*. The researchers also wrote and administered a multiple choice reading test and collected a writing sample from the students. Based on the results, both groups were similar in skills and prior knowledge of the subjects they would be reading about as part of the experiment. Six trained instructors delivered instruction to both groups over four weeks during students' normal reading instruction. Instructors gave additional sessions to students who were absent at different points of the experiment.

Instructors in both groups taught two chapters from a middle school social studies textbook. The lessons focused on the facts, concepts, and relationships around a unit of thought in a chapter. In both groups, instructors used specific language to talk about the relationships in the content, for example, "Technology changed American life from the way it was" (p. 310). The only difference between the scripted instruction for the experimental and control groups was the explicit teaching of using the GOs and the reinforcement of relationships through the GOs. In the GO group, students filled out a total of five graphic organizers that showed relational knowledge from the text. The GOs were different from each

other to best mirror the structure and content of the text. Instructors also taught both groups how to write a summary. Finally, observers watched each of the groups to determine fidelity to the instructional script.

In general, each lesson followed a basic pattern. The first 5-10 minutes was focused on vocabulary and difficult-to-decode words from the text. Students orally read passages and then the teacher would ask follow-up questions. The end of the class included making the relationships implied in the passage explicit. In the control group, the instructor did this verbally, while in the GO group the instructor guided the class to fill out a graphic organizer.

To quantify growth and differences between groups, the researchers used several measurements. One followed the same format as the multiple-choice pretest, but was an alternate test so that students would not become test-wise. The second measurement was eight content knowledge fact quizzes. The students took the multiple-choice quizzes the day after the relevant reading. Both the tests and quizzes assessed students' content knowledge. Finally, students wrote two domain knowledge essays. They wrote the two essays 7 and 20 days after instruction began. Before writing, students reviewed their materials. Instructors encouraged students from the GO group to examine their filled-in GOs. In scoring the essays, scorers looked for relational knowledge statements and how much each student wrote. For all the measures, two trained and independent scorers graded the assessments and the researchers checked for interscorer reliability.

On the multiple-choice tests, both groups performed better on the posttest than the pretest, with no significant difference between the two groups. The two groups also had no significant difference on their scores on the quizzes. On the essays both groups wrote more than they had on the pretest. However, students in the GO group used significantly more relational knowledge statements than the control group. From the results, the researchers made several conclusions. First, students with LD benefit from using GOs to help with recall of relational knowledge. Second, students with LD benefit from a longer treatment than what had been used in previous experiments, evidenced by the marked improvement of the essays from 7 days to 20 days into instruction. Third, the type of tools used to measure the effect of GOs produced different results. There was no difference in factual recall on the multiple-choice tests and quizzes, but a significant difference in the essays.

DiCecco & Gleason gave several cautions in generalizing the results to other settings. In their review of the research, they noted that one of the difficulties with studies around GOs is the lack of uniformity on instruction and implementation of graphic organizers. The authors maintained that simply giving a graphic organizer is not the solution to helping students with LD find relationships in expository text. The teachers modeled, guided, and provided time for practice with the GOs. Another important variable that could have affected the results is the instruction on summary writing. Based on the writing pretest, the researchers determined that this was a skill the students were struggling with, and they provided additional training. While the GO group was able to include more relational statements in their summaries, both groups were able to write more complete summaries by the end of the experiment. With those considerations in mind, there were many strengths of this study. The design of the experiment accounted for the confounding variables that could have hindered internal validity. With trained observers, instructors, and scorers, the researchers limited variations on instruction and scoring, ensuring that the experiment was reliable.

As a teacher, I am more interested in helping students do the thinking required by a content area rather than factual recall. The results of this study indicate that using GOs with students with a LD can help them make the relational connections between events. In other words, they are doing the thinking required to help them succeed in the content area of social studies. As I continue in my practice, I would

like to explore GOs further. How do GOs help students with relational knowledge in language arts? How do GOs have to be modified to accommodate the different text structure of novels and expository text? Finally, how would this look in a general education classroom with a limited population of students with LD? Is this a strategy I would use with all my students, or is it something I would work on as a mini lesson with a smaller population of students? DiCecco & Gleason maintained that it is a strategy that needs to be taught over a period of time, so I wonder what that would look like in a general education classroom.

***Strategies to support writing.*** Just as students with LD have trouble with applying effective reading strategies, they can also struggle with applying strategies to structure and produce quality writing. While expert writers often spend extensive time planning their writing, students with LD usually spend less than a minute (Sturm & Rankin-Erickson, 2002). Sturm and Rankin-Erickson's main research question focused on the effects of using hand-drawn concept maps, computer-generated concept maps, and no concept maps on the descriptive paragraph writing skills of middle school students with learning disabilities. Concept maps are a visual representative of thinking, showing the relationships between ideas. This experiment had a repeated measure within subject design. After instruction, each group of students wrote six essays, two with each type of concept mapping and two without any mapping. The three groups completed these "posttests" in different orders. The researchers conducted the experiment in an eighth-grade English/reading support classroom. Although the teacher gave all students in two class periods the instruction, the researchers only analyzed the data from a group of 12 students who fit certain criteria, ensuring that students had similar skill levels and abilities. These criteria included having a learning disability and receiving special education service for written expression.

The researchers conducted the experiment over nine weeks. In the first week all students wrote two baseline essays. In weeks two and three, the classroom teacher gave instruction on hand-mapping and computer-mapping. The lesson sequence followed this pattern: The teacher introduced concept mapping by giving a description and leading a discussion on the goals and purposes for using concept mapping as a writing strategy. The teacher then modeled hand concept mapping. Students memorized and displayed mastery of the steps, and then engaged in guided practice with teacher feedback. As part of this process, students used prompts that would help them think about the writing process. With the exception of the description and purposes discussion, the teacher used the same sequence for teaching the computer-mapping. For the remaining weeks, students wrote a total of six essays. The researchers randomly assigned students to groups that wrote two essays under each condition: no mapping, hand-mapping, or computer-mapping. The groups cycled through the three conditions in different orders. While the regular classroom teacher taught the lessons, one of the researchers modeled the computer-mapping strategy and remained in the room the whole time to provide support and monitor consistency throughout the project.

The researchers measured growth by comparing the two baseline essays with the six essays students produced in the second part of the study. Scorers graded the essays on both quantitative and qualitative measurements. Quantitative measurements were number of words, syntactic maturity (measured by the number of words in main clauses), and number of main clauses. The qualitative method scored students on realization, clarity/quality, organization, quantity/density, and language mechanics. Across essay conditions (no map, hand-mapping, computer-mapping), students' scores significantly improved on length and quality. However, there were no significant differences based on the writing condition. The only area students did not improve on was syntactic maturity. As the experiment

progressed through the weeks, students writing scores' often increased, regardless of condition. One possible conclusion was that practice was a variable that affected students' performance.

Since there was no significant difference between students' performance based on writing condition, the authors offered a few explanations for why students' improved in their writing skills during the experiment. The authors argued that prior to instruction, many of the students practiced "dump writing" (p. 134). By "dump writing," the authors meant students would write down everything they could easily remember about a prompt and then be finished with their essay. As part of the concept mapping strategy instruction, students used metacognitive prompts that helped them add and expand on their ideas. These prompts, instead of the pre-writing strategy of concept mapping, could have affected the length of students' writing. The additional strategies and instruction throughout the course of the experiment could also have contributed to students writing better paragraphs by the end of the study. The fact that other variables could have contributed to the measured results limits the generalizability of this study because it is impossible to isolate what variable had the greatest effect on students' writing abilities. The researchers did give a sufficient description of the treatment to be able to use the strategy in a different context.

The researchers accounted for reliability of the testing by ensuring a strong interscorer consistency. Two independent scorers graded all of the essays and discussed the scores when there was a difference greater than two points for qualitative measures, showing that the documented growth is reliable. They also had the researcher in the classroom with the teacher to ensure instruction fidelity. One of the greatest threats to the internal validity of this experiment is the lack of a control group. The researchers did not expect to see the gains that students experienced on writing in the no mapping condition, so they had not anticipated needing a control group. Without this group, it is more difficult to ascertain what variable had the intended effect on writing.

Because of the inconclusive results, I would be hesitant to employ concept mapping as a *required* strategy for students in my classroom. Using anecdotal evidence, the researchers said that one student greatly enjoyed using the concept mapping, especially on the computer, while another did not like using it. I might want to teach concept mapping to all my students, and then have it as an option for students to choose if they feel it helps them organize their ideas and write better. However, there was another part of the study that reveals interesting data on students' feelings about writing. The only significant change in positive feelings towards writing from a pre-survey and post-survey was when students were able to use the computer-mapping strategy. As a teacher, I want to attend to strategies that could increase engagement and enjoyment of activities that are typically disliked by students who are struggling in that academic area. I now wonder how the enjoyment of academic work increases students' skills and confidence.

While collaboration has been a part of many of the previous studies, Hallenbeck's (2002) research question specifically focused on collaboration between students with LD as they wrote. Grounded in research and theory, Hallenbeck conducted a qualitative case study over the course of a year with a small group of students. The researcher gave no indication of how he chose this sample. The study focused on one special education classroom with four students and one teacher in a consolidated school located in a rural area in the upper Midwest. The four students were all white seventh graders, with an even distribution of males and females. All the students met criteria for learning disabilities and struggled with expository writing. Their performance on standardized reading tests and their ability to write essays were varied when the study began.

Hallenbeck started his study with a theoretical framework. The main framework was a “sociocultural theory of social constructivism” (p. 228), based on the work of Vygotsky, and focused on how students construct knowledge in a social setting. Hallenbeck examined how the teacher (in the role of mentor) and students interacted with each other to construct knowledge. The author also drew on a behavioral approach that focuses on direct instruction and a cognitive approach that emphasizes teaching “strategy steps, cognitive modeling, guided instruction, and self-regulation” (p. 229). The study took place over a school year, from September to May. The classroom teacher first modeled writing an essay on a subject students were familiar with by using think alouds. Throughout the instruction, he drew attention to the different steps of the writing process – planning, organizing, writing, editing, and revising. In pairs, students then had to write their own paper on a topic of their choice with the support of their partner. The females and males chose to work together. This first paper was done slowly, with a lot of practice and guidance. The teacher emphasized collaboration throughout the entire writing process, not just in the editing step. He also consistently pointed to students’ expertise, taking away his status as the sole holder of knowledge. Finally, students collaboratively wrote a second paper that required additional research, with less teacher assistance.

Hallenbeck used several modes of data collection. The students wrote pretest papers at the beginning of the year that the teacher scored on the same rubric as the two collaborative papers. The rubric rated the following areas: overall quality, text structure and organization, number of words, and writing for a specific audience and purpose. The teacher also tape-recorded all of the classroom procedures throughout the year. Before the school year began, the researcher chose four key points in the writing process to focus his analysis. He triangulated the data from those four points with the data taken throughout the rest of school year. He coded the conversations, using five iterations of the coding scheme as the study continued. Eight categories emerged, but Hallenbeck focused his analysis on three: teacher modeling, teacher scaffolding, and students accepting responsibility for their own and their peers’ writing development.

Three of the students performed better on their “posttest” essays than on their “pretest” essays in the areas of overall quality, structure and organization, and writing for a specific purpose and audience. Hallenbeck argued that a possible explanation for the one student who did not perform better was that at the end of the year this student had behavioral issues that kept him from successfully completing a better essay. But based on this student’s conversations throughout the study, he was able to internalize the writing strategies and support his partner in employing them as well.

Using his analysis of the teacher’s modeling and scaffolding, Hallenbeck concluded that these strategies allowed the teacher to influence students’ practices, without taking away students’ responsibility to engage in the important thinking needed to write. The author maintained that an essential practice the teacher engaged in was to turn over responsibility to the students, instead of always responding with the answer. Based on the collaborative conversations between students, they showed the willingness and the ability to ask each other for help and to provide it in meaningful ways. Through this process, students exhibited more interest and increased skills in writing than they had at the beginning of the year. Based on his analysis of the data, Hallenbeck offered implications for teachers that included: the intent of instruction is for students to become more independent writers; the main goal of writing for a purpose and audience should not get lost during the specific steps of the writing process; use rubrics for different parts of the process to help students self-evaluate; and be willing to relinquish control to the students.

While these initial findings are promising, there were aspects of the study that make it challenging to transfer to other contexts. While the author does give a thick description of the case, general education teachers rarely teach a class with only four students. Monitoring two groups of two is completely different from monitoring 15 groups of two, which is what it would look like to employ this strategy in a typical general education classroom. Also, throughout the study, the teacher was able to devote most of the class time to the writing process. In the general education classroom there are usually more content goals and standards to work through. For example, even in a language arts classroom, teachers have to devote time to reading, not just writing.

Hallenbeck attended to credibility by triangulating his results, using student work and taped interactions to form his conclusions. He also engaged in a prolonged (year-long) observation. A challenge with the credibility of this study is that there was no evidence of member checking or peer debriefing. With such a small sample size (four students and one teacher) and only one researcher, it seems there could be opportunities for biases or pre-conceived ideas to affect the conclusions. Hallenbeck attended to dependability by highlighting the process of the case study. Starting with a theoretical framework, his question was simply to explore collaborative writing in special education. As he coded the conversations he identified eight assertions about collaborative writing. From these eight, he chose three for the focus of study. He could have increased the dependability of this study by explaining why he chose those three over the other five. If he had more thoroughly examined other assertions, there might be different conclusions about what affects the process collaborative writing.

In my own practice, I plan to use modeling and scaffolding as a way to give responsibility to students. Hallenbeck shares detailed examples of the different ways the teacher engaged in those strategies. I want to engage in further research to determine how to encourage students to write collaboratively in a mixed ability, general education classroom. Based on the difference in conditions from the study to my context, I am not yet ready to employ the collaborative writing pairs from this study. Many of the additional implication that Hallenbeck offered to teachers seemed directly connected to his previous analysis, but he also mentioned the importance of having rubrics for the different stages of the writing process so students can self-monitor their progress. I am curious about how the teacher used them in the classroom and what effect they had on students' skills and willingness to take control over their own writing.

**Summary.** Several patterns appeared across the studies. For the four quantitative studies (DiCecco & Gleason, 2002; Jitendra et al., 2000; Johnson et al., 1997; Sturm & Rankin-Erickson, 2002) the sample sizes were all smaller than what experts recommend for experiments (Mertens, 2010). This can limit the generalizability of the studies, since the small sample size might not accurately represent all students with LD. For these quantitative studies, the researchers used several criteria to ensure that the student sample would be somewhat similar in skill, mostly to verify that the treatment was not too difficult or easy for them. When generalizing results to my classroom, I need to remember that they are only for a specific population of students with LD. Students with less or more skills in reading and writing might need different supports.

Across all studies, students with LD improved in their reading and writing skills, regardless of the strategy. The quantitative studies all focused on a specific treatment that introduced a new strategy as the independent variable. However, in each of the studies instructors encouraged collaboration, modeled and taught the steps of the strategy, and gave the students feedback and a way to self-monitor progress. I wonder how these teaching practices affected the final results. Would almost any reading or writing strategy produce a significant learning effect when it is taught well?

My question did not just focus on how to help students with LD increase their skills in reading and writing, but also how to improve their confidence as readers and writers. While some of the quantitative studies incorporated the use of self-monitoring strategies, the data was inconclusive as to its effect on students' confidence. The one qualitative study (Hallenbeck, 2002) explicitly looked at teacher modeling and scaffolding and found that it seemed to be connected to increased student ownership over their own and their peers' writing. I would like to do additional research on how teachers can give away knowledge and responsibility to students with LD.

This project began with a focus on differentiating for student readiness. While this was helpful for focus, one study in particular helped me recognize that students with LD are not just defined by their readiness level. In Sturm and Rankin-Erickson's (2002) study, they gave anecdotal stories from two of the students in the study. One student loved using concept mapping, especially on the computer. He found the whole process neater and easier to use than hand mapping and he felt it had a positive effect on his writing. Another student did not like using concept mapping at all. As a teacher, I need to remember that in addition to the specific learning needs that students with LD have, they will also have their own interests and learning styles that affect what strategies are useful to them. So in my classroom I can teach strategy options – concept mapping, graphic organizers, etc. – and then let students choose what to use, based on what will work well for them. By doing this I will be attending to the student as a whole person, not just as someone defined by their disability, and I will be practicing differentiated instruction in a more authentic way.

## **The Use of Differentiation Techniques in Mixed Ability Groups**

*by Nick Morais*

Students with disabilities are major subjects of research performed in the field of education; however, special education (SPED) students with learning disabilities are no longer compartmentalized in homogeneous classrooms, as they once were. Classrooms in today's schools are much more heterogeneous. These heterogeneous classrooms are made up of diverse types of learners, where students differ in both age, and ability levels. The ability levels of students can vary by disability as well as if the student qualifies for ESL (English as a Second Language) or ELL (English Language Learner) services. The result of the diversity of ability levels in these classrooms is that the students have varied learning needs. It is within these classrooms where the topic of mixed ability groups is brought to the table. Ability groupings, also referred to as tracking groups, are homogeneous groupings of students that have similar ability levels (Dooley & Kossar, 2010). Mixed ability groupings can then be understood as heterogeneous groupings of students that have varied abilities (Tomlinson, 2001).

**Current Research.** Mixed ability grouping is a topic that has not been researched in full until recent years. Because of this, research is still young regarding the connection between the use of differentiation strategies in mixed ability settings and student success. The findings from the current research, and the reviews of such research, are that it is still up for debate as to whether or not mixed ability grouping is useful for helping students (Belfiet al., 2003). Research has also found, which can build a case against mixed ability grouping, that peer socialization between SPED students and general education/gifted students can cause issues with the implementation of differentiated instruction within these mixed ability groups (Poole, 2008). However, new perspectives have been researched recently that uncover new ways of differentiating instruction within mixed ability groupings. The findings also suggest

that through integrating technology into differentiated instruction, the success of differentiating in mixed ability level groupings has been increased (Haelermans, Ghysels, & Prince, 2013).

The current research on differentiation within mixed ability groupings is limited in scope. Further research still needs to be performed to investigate its effectiveness within a greater variety of contexts, such as within a secondary setting. Additional research is also needed to further to reveal more about the effect of mixed ability groupings on students at an emotional or behavioral level. This has been a major area of conflict in the research. So far current research in this area rarely focuses on students with ADHD (Attention Deficit Hyperactivity Disorder), ADD (Attention Deficit Disorder), Communication Disorders, or those on the Autism spectrum. As a result, the effectiveness of differentiation in mixed ability groupings that contain students with these disabilities has yet to be fully covered. Differentiated instruction and its use with various types of mixed ability groupings is further being developed and researched, in order to gain a greater understanding as to its effectiveness in promoting student success.

Research was performed using databases via EBSCOHOST and JSTOR. All research articles used in this literature came from peer reviewed articles. The research articles were required to be published between 1990-Present. The following search terms were used to find the articles: “Differentiated Instruction”, “Mixed Ability Groupings”, “Differentiated Mixed Ability Groupings”, “Special Education Mixed Ability Groupings”, and “Secondary General Education Mixed Ability”. Five research articles that were relevant to the research question were found. Articles where research was performed in the area of secondary Social Studies were not found. Three of the articles took place in a secondary education classroom. The remainder of the articles explained research in elementary classrooms. All of the articles were situated within a general education classroom. The articles found were limited in scope with regards to the context needed. Since, the research found was not situated within a secondary Social Studies classroom, it is important to note further research may need to be reviewed in this area. From the research found there is evidence that shows effectiveness of mixed ability groupings with regards to student achievement. Little evidence exists as to what differentiation strategies are most effective in heterogeneous groupings.

***Rationale.*** The commonality of classrooms with diverse types of learners is a major argument for the importance of looking closer into how differentiation can help classrooms with mixed ability levels present. The goal of this section is to develop a greater understanding about differentiation in the context of mixed ability grouping through a critical review of research. This review of the research will seek to determine whether or not differentiated instruction is an effective strategy for use in mixed ability groups that contain special education students. The question comes as result of wanting to understanding more about strategies that can be used to aid students with special needs in their academic achievement. The findings from the research will be used inform instruction within the context of a secondary social studies classroom. The research that will be critically reviewed makes use of varying research designs, and types. Mixed ability grouping research has been performed using both quantitative and qualitative research designs. The types of research within these designs include case studies and experimental studies. This varied research will be used to identify a possible answer to the question posed in this review of literature, and to inform future teaching decisions, along with areas of research that still need to be addressed.

#### **Review of research.**

***Social impacts of mixed ability groupings.*** Pearl et al (1998) conducted a survey in classrooms from four areas of the U.S., in order to better understand the social integration of students with mild behavior disorders in general education classrooms. The researchers in the study recruited fourth, fifth,

and sixth grade classrooms that had students with mild disabilities. The label mild disabilities means in the context of the study that the students have been fully integrated in a general education classroom for two months prior to the study (Pearl et al 1998). The students with mild disabilities attended general education classroom 50% of the day. The 59 classrooms located in urban areas of Chicago, suburban areas near Chicago, rural county in North Carolina, and a small city in North Carolina were chosen for the study. 49% of the sample came from the Chicago area schools, and 41% came from North Carolina schools. The composition of the students in the sample were 49% female, 49% white, 44% African American, and 7% Hispanic. The sample was 83% general education students, 13% students with mild disabilities and 4% were academically gifted students. The survey used in the study was made voluntary to students. 66% (N=1022) of the students in the 59 classrooms took the survey. 627 of the students were from the Chicago area and 395 were from the North Carolina schools. 12% (N= 119) of the students who took the survey were those with mild disabilities.

Mixed methods data was collected using a multi-method survey. The data collected consisted of self, teacher, and peer measures. The data used in the analyses consisted only of the peer data. The survey was given to students in the mid-to-late fall. The surveys were given to the students by two doctoral students, one of the researchers and a research assistant. The students were seated and told to cover their responses to ensure privacy while the survey was being administered. Students were told that no one would see responses except for the researchers. The students also had a choice of what questions they wanted to answer. The students' identities were coded to conceal them after survey was taken. The questions asked on the survey established group membership, as well as social and behavioral characteristics. The data was then used to answer the following questions: "Do students in general education classrooms perceive students with mild disabilities as being members of peer groups? How do peers perceive the behavior of students with mild disabilities in general education classrooms? Do classmates perceive the behavior isolated students differently from how they perceive the behavior of students who are members of peer groups? And what are the behavioral characteristics of the peer groups of students with mild disabilities?" (Pearl et al, 1998,174-175, 178).

The research suggests that students with mild disabilities were not often seen as prosocial, instead they were often viewed as anti-social or "social isolates" (Pearl et al, 1998). The research also shows that students with mild disabilities that were anti-social were not viewed as leaders or parts of peer groups. Students identified as being anti-social that had mild disabilities were seen as being a part of peer groups. The research states that this means that students with mild disabilities may need social skill training in order to prevent non-social and anti-social behaviors (Pearl et al, 1998).

The limitations of the study were that due to high variation in sample sizes of students with disabilities, comparisons could not be made to varying types of disabilities. The study only focused on students with mild disabilities, so students with more severe disabilities have not been accounted for which may make it difficult to generalize the findings to these types of students. I may need to perform additional library research into how students with different disabilities may be affected by social interactions in mixed ability classrooms. The finding of this study highlighted that students with mild disabilities have non-social or anti-social characteristics, which can complicate the effectiveness of mixed ability groupings. The study also provided background to how students with mild disabilities may interact in a general education classroom.

Pearl et al (1998) gave details into how the interactions of students with mild disabilities were perceived in mixed ability classrooms. While this research gave important information that should be considered for the use of mixed ability groups, it is important to also look at how student achievement in

these groups can be impacted by social issues. In 2008, Poole conducted a study that further sheds light on social issues that can occur in mixed ability classrooms. The purpose of this study was to better understand the effects of interactional differentiation in mixed-ability groupings with two struggling readers. For the overall study, the researcher sampled from two groups of fifth grade students attending an urban elementary school classroom. The elementary school was chosen because of its inability to make progress in standardized tests scores. 50% of the students that attended the school were unable to meet reading standards. The teacher of the class chose the 10 students that were in the mixed ability groups studied. The students were chosen specifically for their reading ability. Three of the students chosen were below grade level readers. The three students chosen were all monolingual English speaking students. One of the low ability readers were in one group. The other two low ability readers were in the other group. Students from both groups used the same nonfiction reading material over the course of the study. The reading material was completed by both groups over the course of two days. The two groups met separately for 20-25mins per day during the study (Poole, 2008).

Qualitative data was collected using audio and video recordings of the students. The data collected from the audio and video were verbal communication of students along with body language and movement. This data was then converted into written transcripts, the researcher and teacher looked for instances of correction/assistance, interruption of others, pauses, and taking turns (Poole, 2008).

This research suggests that low-ability readers in the mixed-ability groups experienced problems with interacting with other students within the groups. The students were observed as being interrupted by other students' in the groups and not reading as much as other students. The researcher's analysis of two struggling readers was that mixed-ability groups hindered the students' ability to read, as well as their participation (Poole, 2008). The researcher's analysis revealed reasons such as instructional choices that may have contributed to the struggling reader's inability to interact and struggle with reading within the mixed-ability groupings ( Poole, 2008). I need to perform more research in order to understand more about the social considerations that need to be made when using mixed ability groups.

One limitation of this study was that the data was performed in an elementary classroom versus a secondary education classroom. The amount of data from this study limits the transferability due to the small sample size. Further research by me is necessary to determine whether or not social interaction within mixed ability groupings effects academic achievement. A strength of this study is that it touched on the juxtaposition between social interaction and academic achievement in mixed-ability groupings, much needed focus within differentiation research.

***Student achievement within mixed ability groups.*** Venkatakrishnan and William (2003), performed a case study to compare homogeneous tracking groups to mixed ability groups in order to determine how mixed ability groups as compared to homogeneous groups are connected to student achievement. The case study was focused on a mathematics classroom in a secondary education school in Greater London. The school was composed of mainly of working class students, but the school had more affluent students enrolled as well. The mathematics department at the school was trying to identify an effective strategy for raising achievement in mathematics using tracking versus mixed ability groupings. The students were grouped into blocks. Block 1 included one homogeneous group, and four mixed ability groups. Block 2 included one homogeneous grouping, and three mixed ability groups. Block 3 had just one mixed ability group. The focus teachers were chosen because of their awareness of the new school policy about tracking in mathematics, and they taught at least two of the groups in the blocks (Venkatakrishnan, H., & William, D., 2003). The teachers had full control over how the groups operated. Block 1 received more support from staff than the other Blocks due to a large proportion of ELA students.

Block 2 teachers received the least amount of support from staff. The Blocks then were compared using the data collected.

Both qualitative and quantitative data were gathered. The data came from interviews with teachers working in the Blocks, as well as standardized test scores from the KS 3 and GCSE. The interviews expressed information about how students worked together in groups, complications dealing with behavior, and effects of classroom environment (Venkatakrishnan, H., & William, D. 2003). The data was analyzed to control for biases for ethnicity through assigning random signifiers to the students. Research revealed that the mixed ability groups did benefit student achievement. The students in the mixed ability groups performed better on the standardized test than those in the homogeneous groupings (Venkatakrishnan, H., & William, D. 2003). The research also revealed that support for teachers using mixed ability groups did improve the effectiveness (Venkatakrishnan, H., & William, D. 2003).

The limitation of this study is that it did not provide research into the use of differentiation in the mixed ability groups within a variety of content areas. However, the study did provide evidence that mixed ability groups do increase student achievement. Furthermore this research shows that mixed ability groupings have the potential to be successful when additional teacher support is given. Support in this study entailed instructional and classroom management support from other staff in the mathematics department (Venkatakrishnan & William 2003). I need to perform more research in order to see how mixed ability groupings are affected by how much support a teacher is given by administration and other faculty.

***Using technology to differentiate instruction.*** Haerlemans et al (2013) conducted a randomized experiment on a Biology class located in the Netherlands that explored the effect of digital differentiation on student achievement. The researcher performed research on a secondary education school for 12 weeks. The school is located in a rural region of the Netherlands. 115 students were chosen to be a part of the study. The students were chosen and randomized based on economic class, gender, age, and if they have repeated grades. The sample was divided into 5 classes. The treatment group was composed of 57 students. The control group was composed of 58 students. Digital differentiation was introduced and practiced by the control group and the treatment group for one week (Haerlemans et al, 2013)..

The experiment began two weeks after the start of the school year. Over the course of the experiment the teacher was present and worked in the same capacity for both groups. The experiment used three units as the content the experiment, which were “metabolism and respiration”, “blood circulation”, and “your health” (Haerlemans et al, 2013, 6).. The pretest and posttest were taken weekly. The first pretest marked the beginning of the experiment, and the last posttest marked the end of the experiment. While both groups used digital differentiation. The treatment group used the pretest as a form of deciding which track the students would be on for the next unit, based on the student’s results. The tracks that the students from the treatment group were named: “the practical prevocational track, the theoretical prevocational track and the higher general track” (Haerlemans et al, 2013). The pretest and posttest were different depending on the track. The content remained the same for all three tracks but the challenge of the work increased or decreased depending on the track. The control group took the same pretest and posttest but could not move to a different track instead they always remained on the “theoretical prevocational track” (Haerlemans et al, 2013).

The quantitative data taken from the pretest and posttest scores was used in order to identify the treatment effect from the use of digital differentiation. The data was analyzed to check to see if economic class was a factor in the pretest scores, to check for outliers. The research revealed through the analyzing of data that digital differentiate did improve student achievement in biology (Haerlemans et al, 2013)..

Limitations of the study were that it focused only on one school and did not provide research into how the mode of differentiation might work in a different context. The strength of the study is that it touched on the subject of a method of differentiation that is not well researched. The research also took place in a general education classroom. The strength of the study also was that the researchers used methods to analyze the data to insure economic status did not affect the test scores. I need to perform more research into how various methods of using digital differentiation can help students achieve in mixed ability settings.

***The effect of differentiation on student achievement within mixed ability settings.*** Unlike the other studies which compared mixed ability groups with homogeneous groups, this study focused only on mixed ability classrooms. Reis, McCoach, Little, Muller, & Kaniskan (2011) performed an experimental study on several elementary schools in the U.S. to look at the effects of differentiated instruction on comprehension in reading. This research took place in 70 elementary classrooms, which were chosen based on school size and a broad representation in race, learning ability, ethnicity, and socioeconomic status. The schools were chosen for size by the amount of classes the school had per grade. The schools needed to have at least three to four classes per grade level. The schools chosen for the study were one suburban southern school, one urban southeastern school, one urban magnet school, one rural southern school, and one suburban Midwest school. The grade level of the elementary classrooms that were chosen included third, fifth, and two second grade gifted classrooms. The sample size consisted of 1,192 students for the study. The teachers of the classrooms had on average 14-16 years of experience (Reis et al, 2011).

The students and teachers were both randomly assigned to the treatment and control groups. The teachers were given training in the enrichment program prior to the experiment. The researchers observed teachers during the course of the experiment to check for treatment fidelity. The treatment group was composed of 37 classrooms and 33 were in the control group. A differentiated instruction reading “enrichment program”(Reis et al, 2011) was used in the treatment group. The control group did not receive the “enrichment program” but instead received the normal instruction which was whole group instruction. The experiment started two weeks from the start of the school year, and ran for five months. The teachers taught two-hour blocks during the course of the experiment. One hour was devoted to the “enrichment program.” One hour was devoted to teaching writing and vocabulary activities. The teachers used several fiction and non-fiction books that were at different levels, and provided subjects for multiple interests to teach using the “enrichment program”. The enrichment program was a school-wide program that used student interest as form of building skills in reading fluency and comprehension (Reis et al, 2011).

The research team both collected data and provided support for teachers using the “enrichment program” (Reis et al, 2011). The quantitative data collected related to oral reading fluency, reading comprehension, which came from pre- and post-tests taken by students; as well as a survey based on teacher’s engagement with their own personal reading. Qualitative data was collected to see what administrators, teachers, and enrichment program trainers from the schools saw as being a benefit to students. This data came from observations about student engagement and changes in students reading habits.

The quantitative data taken from the test scores was used to determine if the treatment affected reading fluency and comprehension of the students. The data was analyzed using a method that controlled for gender, ethnicity, and grade level. This is important because it made the focus of the data about student achievement and not about the student descriptions. Analysis of data revealed that

differentiated instruction using multi-level texts with multiple subjects of interest increased overall student achievement in reading fluency and comprehension (Reis et al, 2011).

The limitations of this study were that the focus of the research was done on a whole program, and did not highlight the use of one strategy (Reis et al, 2011). In other words, was it the combination of using multi-leveled text with text that accounted for students interests or was it a particular part of the enrichment program. However, the researchers controlled for fidelity during the course of this study, through researcher observations, which helped insure the “enrichment program” was being used properly in the scope of the experiment (Reis et al, 2011). The research shows the potential differentiated instruction has to help increase student achievement. I need to perform further research in order to identify specific differentiation strategies that may affect student achievement within mixed ability groupings.

**Summary.** Differentiation in mixed ability groupings has the potential to benefit students with learning needs through increasing student achievement, content goal achievement, reading fluency and reading comprehension. It has the potential to do this through the use of digital access to content and activities (Haerlemans et al, 2013), and using texts that are multi-level and attend to student interest (Reis et al, 2011). However complications may arise in mixed ability groupings (Pearl et al, 1998). These complications deal with social interactions between students of different abilities. The problems are that students with disabilities may be isolated within these groups due to anti-social and non-social behaviors (Pearl et al, 1998). Students with learning disabilities may also lessen participation within the groups if the student is interrupted or corrected too often by other students in their group (Poole, 2008). These complications can cause issues with the peer to peer interaction that exists in mixed ability groupings.

***Differentiation in mixed ability groupings in secondary social studies.*** The research on the use of differentiated instruction in mixed ability groupings focused primarily in subjects other than social studies. However, because of the possible benefits to student achievement, it is important to explore how differentiation within mixed ability groupings might be applied to the social studies classroom. It may be possible to use strategies such as differentiating for interest through texts in a social studies classroom in order to increase a motivation to read, and access content (Tomlinson, 2001). In social studies classrooms it may be possible to use leveled texts, such as those that focus on varied civilizations or people that students can connect with (through the lens of cultural relevancy). Within mixed ability groupings, students could discuss their readings as a way to understand more about the social studies content. Also, the use of technology, such as differentiated digital media, in the form of multi-leveled social studies based webquests, may help students with a variety of learning needs meet the learning objectives and increase student achievement.

***Areas for future research.*** Further research should be looked into on the use of differentiation in mixed ability groupings in general secondary education classrooms, but should also explore its use in the subject of social studies. Tomlinson (2001) has presented the principles that support the use of mixed ability groupings and the use of differentiation within them. As such, further research needs to be performed where differentiated instruction is in use within mixed ability groupings in more capacities. Due to the findings of Pearl et al (1998), and Poole, D., (2008) it would also be prudent to conduct further research about how negative social interactions can be decreased in mixed ability groups. Research in this area may help with uncovering strategies for how students within mixed ability groups can have meaningful discussions within the group. Research may also need to be performed focusing on more types of differentiation strategies in mixed ability groups, such as those that address student products.

This may help determine the effectiveness of differentiation in mixed ability groupings in a larger variety of ways.

Based on the current research on mixed ability groupings it appears that they have some capacity to increase student achievement with the use of differentiated instruction. The use of differentiated instruction in mixed ability groupings has the potential to help students with that are enrolled in general education classrooms. However, social considerations need to be addressed that could potentially reduce the effectiveness of these groups. Despite the possible challenges regarding social interactions and participation, it is recommended that students with special needs working in mixed ability groups receive differentiated instruction in order for them to achieve.

### **Group Summary and Findings**

The purpose of this project was to investigate strategies we could use in the general education classroom to support students with specific learning needs using a differentiated instruction model. The beginning portion of our work examined the effectiveness of different strategies to support students with autism spectrum disorder (ASD). Students with ASD are challenged by the social nature of the classroom, including working and collaborating with peers, independently transitioning in the class and even engaging in and sustaining conversations with others. Research support the correlation between social skills development and student independence, engagement in post school employment (Nuernberger et al., 2012). The different researchers looked to various strategies educators can use to build in supports for such students. Patterns emerged in the research in regards to specific intervention strategies such as teacher led modeling, behavior training, and visual supports- including photos, video and graphic organizers. In each of the studies under investigation, student performance improved with the implementation of these various strategies. Also, in each study there was a form of teacher led instruction or modeling of the strategy prior to student practice.

The next section of the paper focused on strategies that could support the reading and writing skills and confidence of students with learning disabilities. Students with LD often struggle with appropriately applying strategies while reading and writing, and as their academic career continues they tend to take less ownership over their academics (DiCecco & Gleason, 2002; Hallenbeck, 2002; Sturm & Rankin-Erickson, 2002). Based on the initial research, all the strategies that researchers used improved the performance of students, even if the students did not overtly use them on the posttests. These strategies included a main idea identification strategy, story grammar, and graphic organizers for reading and concept mapping for writing (DiCecco & Gleason, 2002; Jitendra et al., 2000; Johnson et al., 1997; Sturm & Rankin-Erickson, 2002). Although there was some limited data on the effects of attitude on reading or writing in these studies, the strongest case for how to increase the efficacy of students was in the one qualitative study (Hallenbeck, 2002). This study focused less on a specific strategy and more on way of learning to write through teacher modeling and collaboration with peers. Through the peer collaboration students had to take control of their writing, which seemed to result students' increased confidence in themselves as writers. While there is still much to explore around supporting students with LD in reading and writing, the main points we take away are to include targeted instruction of strategies to help students organize their thinking around reading and writing, and to provide them opportunities to collaborate and take ownership of the process.

The last section of the research examines the effectiveness of differentiation strategies in mixed ability group settings. Mixed ability groupings are becoming more prevalent due to the nature of the modern integrated classroom. Special education students on varying ability levels are enrolled in general education classrooms. A challenge occurs for these students that deal with socialization, access to content, and collaboration. Based on the research student achievement did increase in mixed ability groupings as well as when differentiated instruction was in use (Venkatakrisnan & William, 2003; Haerlemans, 2013). The research also suggests that social interactions and student participation is a factor that can possibly decrease the effectiveness of mixed ability groupings (Poole, 2008; Pearl et al., 1998). The patterns that emerged from the research are that students with learning needs can be isolated in the general education classroom due to non-social and antisocial behaviors (Pearl et al., 1998). We need to perform library research in order to learn how to support students in their interaction and participation in groups. While there is still much to explore around the use of differentiation in mixed ability groupings, the main points we take away are to use multi-leveled texts, and differentiate for interests through the use of digital activities. This is in order to help students with learning needs in a general education classroom to meet learning goals.

As we looked at various needs, including students with LD and ASD, we recognized that we have to incorporate different strategies to meet their needs. One way that we can do it is through giving mini-lessons that will build students' skills in a content area. We have also found that it's important for teachers to model the strategies and behaviors that they expect from students. Teachers should also provide feedback to students on their performance to increase student growth. Although collaboration between students can help students take ownership over their learning, teachers need to be aware that students of higher or average abilities might not interact in a positive or helpful way with students with disabilities. Although we want to attend to the readiness needs of students, we also need to recognize that different strategies will be more or less effective with different students, based on their past experiences, prior knowledge, learning styles, and interests.

One of the concerns we found in our review of the literature was that there is often a research to practice gap when it comes to supporting and differentiating curriculum for students with special needs. One of the possible solutions to this problem is involving teachers in the research and choosing of the strategies to incorporate in their classrooms (Duchnowski et al., 2006; Kutash et al., 2009). Through carefully reading and analyzing the research, we believe we will be able to decrease the research to practice gap as we become teachers who are committed to differentiated instruction in our classrooms.

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# Differentiating Instruction to Create Access to Learning for ELL and Unengaged Students

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Our research focused on strategies for differentiated instruction, curriculum, and assessments to best support English Language Learners (ELL) and unmotivated students. This topic is important because students of all abilities are in general education classes. As classrooms have become more diverse and inclusive, differentiated instruction has become a necessity. This is a literature review comprised of research articles from Ebscohost, ERIC, and ScienceDirect. Our research explored the questions of “How can we differentiate curriculum in a way that improves student’s reading and writing comprehension?”, “What kind of differentiated instruction can educators provide regarding academic vocabulary, that will help improve language minority students performance on writing assessments?”, and “In what ways can educators scaffold curriculum to motivate unmotivated students?”. From our research, we have collectively come to realize that differentiating curriculum and instruction does not only benefit students struggling with learning a new language but even English only students as well. Additionally, it is imperative to assess a student’s first language ability in order to understand the misconceptions and language gaps that students possess. Several implications became apparent our investigations. One was the importance of finding ways to understand a student’s language background in relation to their morphological awareness of words because there is validity in being able to help them make connections between their own language and their new language. Educators should also plan to add flexibility of choice into classroom lessons plans, as it helps to provide engagement for unmotivated students.

**Keywords:** *Differentiating Instruction, English Language Learners, Unmotivated Students*

This paper looks to explore the ways in which we as educators can create access to social studies curriculum for English language learners (ELL). It also explores strategies for creating access for the unengaged student in the classroom. As a group we decided to research differentiating instruction because students of all abilities are in general education, classes and the all need access to the content and curriculum. Students come to school with various backgrounds, abilities and educational readiness for learning and different learning profiles. As classrooms have become more diverse and inclusive, creating access through differentiated instruction has become a necessity. The intent of differentiating instruction is to maximize each student's growth and individual success by meeting the student where they are at and assisting them in the learning process. We decided to focus in on two specific groups of students, English Language Learners and unengaged students, because these were the populations we struggled supporting during our student teaching. Though it should be noted that we are not saying that all ELL students are

unengaged but simply that lack of access to the curriculum may be the reason for students to not become engaged in classroom activities. Additionally, outside of the ELL spectrum, there are students who are not engaged in classroom learning because of a variety of reasons and we believe that access to the curriculum is one of them. While we had previously studied some accommodations we could make for students, we wanted to focus more on accommodations specific to these groups of students so we could ensure that they received the support they needed to be successful in our classes.

The intent of differentiating instruction is to maximize each student's growth and individual successes by finding strategies to better assist them in the learning process (Echevarria, Richards-Tutor, Canges and Francis, 2011). By differentiating instruction, teachers are providing students with differing learning needs access to the curriculum. Rather than providing a single avenue for learning, teachers using differentiated instruction strategies match tasks, activities, and assessments with their students' interests, abilities, and learning preferences. We have come to realize the necessity for finding strategies that create access for a variety of learners in the classroom. Differentiating instruction for ELL and unengaged students will give these two types of students the specific support they need to succeed in the classroom.

For this paper, we have decided to use the Washington State Office of Superintendent of Public Instruction (OSPI) definition for English Language Learners. An English Language Learner is a student enrolled in elementary or secondary school whose primary language is other than English and whose English language skills are sufficiently deficient or absent and will impair learning (Chapter 28A.180 RCW). Primary language means the language most often used by a student for communication in the student's place of residence. While English Language Learner can encompass students who are born in the United States, much of our research focused on students who are immigrants. Another term that has come up in our research in relation to English Language Learner is Language Minority Learner, which refers to a subset of the language minority learner population who lack sufficient English proficiency to benefit from mainstream English instruction without substantial support (August & Shanahan, 2006). These students often need additional instruction in acquiring the English Language, such as an ELL class.

Our definition of the unengaged student comes from the Department of Education at the Virginia Commonwealth University. According to this definition, unmotivated students are students who are disruptive, non-participatory, and who lack a desire to learn (Stewart, 2009). The terms underperforming students and underachieving students also came up during our research on student motivation. These terms highlight students who are believed to not be performing at their ability level. These terms were used interchangeably in the studies we found on unengaged students.

This research question important to the educational community because of the difficulties ELL and unengaged students face in a general education classroom. Focusing specifically on ELL students, cultural and linguistic diversity in American public schools has increased substantially over the past decade. Twenty-one percent of children between the ages of 5-17 years old speak a language other than English at home (Brooks and Thurston, 2010). ELL students face major academic challenges as they work to acquire conversational language skills, as well as the more formal academic language they need to learn content in the English language. Educators need to take into account ELL students' English language proficiency, as well as the many other factors that can impact student learning and performance. In order for ELL students to gain crucial content knowledge, they must first have instruction differentiated in a way that offers the support they need. We hope to explore strategies that better support ELL students in our classrooms.

In our research, we have found conflicting research on language ability and its relation to student learning. Some researchers believe that English Language Learners should focus their energy on acquiring the new language, and that their first language will not assist in the comprehension of the second (Kieffer & Box, 2013). However, there are other researchers who believe that focusing on just the acquisition of the second language neglects the indirect contributions of linguistic backgrounds and experience on a student's ability to learn not only learn a new language, but to engage successfully in class activities. Few studies have examined the role of morphological awareness, or the understanding of how words are formed in language, on the comprehension abilities of language minority students. This has led some researchers to believe that best way to teach language minorities is to immerse them in a new language without paying attention to the deficits in their first language (Palmer, El-Ashry, Leclere, & Chang, 2007).

Many teachers have had students that are underperforming and we saw this as an issue to investigate. What we found is that many students are underperforming because, like ELL students, they lack access to the material. Teachers are not identifying their challenges and using strategies to give them access. We also found that unmotivated students struggle in class due to the lack of accommodations made for these types of learners. Since much of the focus in differentiating instruction can be geared towards assisting students with differences in abilities and readiness, those that are unmotivated get left behind (Stanford, 2009). These students can become burdens for teachers, rather than seen as students with different learning styles. Our hope is to find ways for accommodating lessons to best meet these students' needs as well.

In our research around unengaged students, we found that all of the studies identified motivation as an area of concern. Many teachers and administrators seek to find answers on how to motivate these students. There are many teachers who try to get these students to be motivated, but do not use differentiation to do so. The common theme that we continuously encountered in the research around unengaged students is that differentiation works in these cases. In particular, many studies showed that giving students choices in class is the most effective way to differentiate. For example, teachers can give unengaged students multiple methods of input for them to take in the content and ask for feedback on which method works best for them. Teachers can also choose alternative means for students to express their understanding of the class' learning objectives (Servilio, 2009). The studies repeatedly show that unengaged students' performance improves when they are given more choices in how to express their understandings as a way of differentiating. Again, we discovered that when learners are given increased access, whether they are ELL students or underperforming students, they become more likely to engage in the material and perform at a higher level.

There are three sections to our paper, in which we more specifically focus our work on research related to differentiating instruction, curriculum, and assessments to best support ELL and unmotivated students. To start, Adam Wooten addresses strategies to better support assessing ELL students. More specifically, this section will focus on what kind of differentiated instruction educators can provide regarding academic vocabulary that will help improve language minority students on writing assessments. Much of the research focuses on language minority students' performance in relation to their ability to understand and use academic language. Supporting students' understanding of academic language and key vocabulary assists students in their writing and our ability to assess their learning.

In the second portion, Marisa Bateman will discuss strategies for differentiating reading and writing instruction and activities for ELL students in the social studies classroom. This is an important area of study, as social studies learning requires proficiency in reading and writing in the English

language. Social studies curriculum poses particular challenges for ELL students because much of it assumes both culturally specific background knowledge and proficiency in English literacy skills (Cruz and Thorton 2013). To be successful in the social studies classroom students seem to need to be able to comprehend content specific vocabulary and abstract concepts, as well as perform higher-level thinking. Finding strategies that better support reading and writing will help to give students the tools they need to comprehend social studies.

In the third portion of the paper, Michael Crouch will be discussing strategies for differentiating instruction in the regular classroom to benefit unmotivated students. Many teachers have experienced the challenge of finding ways to motivate each of their students. Students learn in different ways that go with their learning styles, preferences, and profiles. It is impossible to meet each student's needs when the instruction is presented in only one mode. Many students will become lost and disinterested. The answer for this dilemma is differentiation. There are many differentiation strategies that teachers can use that have a positive effect on students' performance. In particular, there are strategies available that focus on differentiating in order to motivate unmotivated students. This third portion of the paper will discuss some of these practices, their legitimacy and validity, and their usefulness in other teachers' practices.

### **Access to Academic Language for English Language Learners** *by Adam Wooten*

The overarching topic that was the foundation of this research assignment was how to create access to social studies content for English language learners. The question, I investigated through reviewing various research studies was "What kind of differentiated instruction can educators provide regarding academic vocabulary that will help improve language minority students on writing assessments?" This relates to my overall group question because at its basis the goal is to find out how to provide access points to content for English language learners and the unengaged student in mainstream classes. The goal of my review of research is to uncover some tested methods for improving students of diverse language abilities to not only understand academic vocabulary, but also be able to use this vocabulary in the same way professionals do, in their respective fields of study.

I chose this topic based on feedback and from frustrations I had with trying to reach a number of language minority students in my English language arts class during my student teaching. I wanted to learn how I could bridge the gaps between a student's native language and English. Furthermore, I wanted to investigate if there were commonalities or patterns between all languages, and if so how can knowledge of these commonalities be used to help language minority students understand what is expected of them during social studies classes. Additionally, after reviewing a few research studies it became clear to me that another significant aspect of language minorities performing better in class was their ability to understand and use academic language. I used these two understandings as my lens to analyze research for transferable practices to include in my own classroom.

Language minority learners in the U.S. disproportionately demonstrate reading comprehension difficulties, exceptionally in middle grades (Kieffer & Box, 2013). Tackling these difficulties requires investigation into the specific linguistic skills influencing students reading and writing abilities. Among the many critical thinking skills students should be learning, morphological awareness and academic vocabulary seem to be two frequently understudied potential difficulties for language minority students.

To identify research on academic language and its effect on student comprehension in Social Studies classes I looked at several databases. I pulled studies for my investigation from Ebscohost, ERIC, Jstor, and ScienceDirect. Additionally, the terms were varied systematically to ensure the identification of variety of research on language minorities and the use of academic language. The search terms I used were differentiation, English language learners, language minorities, and types of scaffolding for ELL students, academic language, academic vocabulary, morphology, linguistics, differentiating curriculum for language minorities in social studies classrooms, and lastly ELL assessment. Also, I consulted the National Council of Teachers of English website in order to review relevant academic discussions around teaching academic vocabulary to ELL students. In my inquiry into differentiation for language minorities I started to see patterns in the terms being used throughout the studies and a majority of these patterns pointed to the importance of language minorities students acquisition of academic language.

The studies I selected for my review of research, related to academic vocabulary and its effect on student performance on assessments. In my review of both qualitative and quantitative research studies several themes emerged. First off, it appeared that a student's ability to speak their native language is key in their ability to understand a new language (Palmer, El-Ashry, Leclere, & Chang, 2007). Second, it seems morphological awareness is a key factor in a student's ability to comprehend academic vocabulary and thus appears directly affect their reading and writing abilities (Kieffer & Box, 2013). Third, by finding academic vocabulary that can be embedded throughout content areas and related to the student in a context they know, myself or other educators may be able to bridge the gap between new and old language understandings (Snow, Lawrence, and White (2010). Lastly, there are various scaffolds for both thinking and language that could be designed to help students succeed on a motivating assessment task, by developing their cognitive and communication skills (Echevarria, Richards-Tutor, Canges and Francis, 2011).

**Critical analysis 1 the SIOP model.** Echevarria, Richards-Tutor, Canges and Francis (2011) conducted a study to better understand the impact of the Sheltered Instruction Observational Protocol ( SIOP) Model on middle school English language learners acquisition of academic language and key concepts. This quasi-experimental study revealed that students receiving the SIOP method outperformed students who did not receive the SIOP Model. This study provided a set of instructional approaches and practices to science teachers in order to support them in helping English language learners (ELL's) access science content. This study is distinctive in that its goal was to provide teachers with the kind of teaching techniques intended to make science content understandable for English learners, as well as, to improve their academic language.

The SIOP model has shown promise for increasing the achievement levels of English language learners across content and grade levels. This model is based on a framework that allows teachers to present content concepts to ELL's through access points in the curriculum and scaffolding that make new information relatable and understandable to students. Consequently, it seems while doing so educator can develop ELL student's language skills in reading, writing, listening, and speaking. The goal of this study was to examine the effects of the SIOP Model on the acquisition of academic language and science concepts among English language learners in a middle school classroom. These findings may shed light on how to differentiate academic vocabulary curriculum so that students can increase their performance on writing assessments.

Echevarria, et al. examined the impact of the SIOP method using a small, cluster-randomized trial with randomization at the school level. Ten middle schools in one large urban district were randomly assigned the SIOP treatment, or the traditional science instruction control. The educators in the treatment

condition were trained in the SIOP Model and then taught four science units using lesson plans and teaching methods that followed the SIOP Model. Teachers in the control section taught the same four topics as the treatment group, but instead stuck to methods they normally used to teach such topics. Both conditions participants were given a pretest at the opening of each unit and posttest at the conclusion to measure growth in attainment of science language and science content comprehension. Additionally, an essay was also given to measure student's use of science language in writing.

The participants were categorized for selection based on the number of English language learners at each school site. Echevarria, et al chose stratified sampling as their method of choosing participants. This meant that schools with large and moderate numbers of ELL students were included, and those with small number of corresponding students were rejected. The schools in each category were randomly assigned to either treatment or control conditions.

The SIOP Model has eight components and 30 features that when used together have often resulted growth in English Language Learners achievement levels. Each lesson plan included eight components which were: *lesson participation, building backgrounds, comprehensible input, strategies', interaction, practice & application, lesson delivery, and review and assessments* (p. 337). The six features under *Lesson Preparation* examine the lesson-planning process, including the incorporation of language and content objectives, the use of supplementary materials, and the meaningfulness of activities. *Building Background* revolves around making connections with students' background experiences, prior learning and developing their academic vocabulary. *Comprehensible Input* involves adjusting teacher speech, modeling academic tasks, and using other various techniques to improve comprehension. The *Strategies* component emphasizes explicit teaching of learning strategies to students, so that they know how to access and retain information. In addition, the *Strategies* component stresses scaffolding instruction, and promotes higher-level thinking. The features of the SIOP Model that involved *Interaction*, remind educators to help students develop academic speech and to group students appropriately for language and content development. *Practice and Application* activities are designed to extend language and content learning, while *Lesson Delivery* involves teachers meeting the learning objective for each lesson. Lastly, the *Review and Assessment* component, considers four items, which are whether the teacher reviews key language and content concepts, assesses student learning, and provides feedback to students on their academic performance in class.

Lesson plans varied in the activities they used, though there were several key features included in the entire lesson plans, such as introduction of content and language objectives and key vocabulary. The plans gave students opportunities for daily student to student interactions, the use of graphic organizers and manipulatives, and graphic organizers, modeling of lesson tasks, and review of key vocabulary, content concepts, and the lesson's objectives at the completion of each lesson. An important element of the content and language objectives was the integration of English language development across the curriculum, which seems imperative for improving ELL student's capability to learn successfully in the classroom. Lastly, to ensure teachers success in using the SIOP model, each treatment teacher received coaching in implementing it into their classroom instruction.

Echevarria, et al noted that while there was significant variability in student performance across all aspects of the English language learners, the treatment group scored better on their assessments than the control group. Most of the differentiation of the treatment group scores was based on the proficiency levels of the ELL learners. Though it should be duly noted that when teacher implementation of the SIOP Model was high, which meant that the teachers were implementing every aspect of the model, student achievement increased somewhat dramatically. After an examination of English Language Learners,

Fluent Language Proficient, and English Only students, the authors revealed that teaching with the SIOP Model was appropriate for all students. This suggests that implementing SIOP Model not only just benefited students struggling with language acquisition but also was meaningful to students of who just speak English as their first language. One could possibly infer that there is value in implementing the SIOP Model to other classrooms with similar demographics. Overall, the performance of all student groups improved on average, which shows that findings may be generalizable to larger populations of students across the country.

The researchers attended to the accuracy of their findings by randomly assigning schools to treatment and control conditions. Additionally, they ensured their findings were relevant to ELL populations by only looking at schools with large ELL populations. Echevarria, et al. provided a sufficient description of the treatment of the SIOP Method and provided examples of reviews of academic literature that they used of a basis for reasoning of their research study. In addition, the members described in great detail the limits to the validity in the finding of their research.

It's hard to determine this study's generalizability due how the researchers used its sampling methods and the fact that most schools included in the treatment had high populations of ELL students, therefore the teachers for the most part all had backgrounds in teaching language minority students in comparison to the condition schools with lower ELL populations. Having a strong pedagogy in teaching ELL students coupled with using the SIOP model treatment may have resulted in biased results when compared to the conditional schools. Additionally, since the study was only 8 weeks long it was hard to gauge the overall impact of the SIOP Model on these middle schools. Finally, the level of cooperation, interest in the study, and level of SIOP implementation varied across the SIOP teachers. Some were enthusiastic about the intervention and were interested in the research, while others merely met their obligations to participate in the study. So in small studies like this one such variability often works to reduce overall impact of the treatment.

In conclusion, the authors noted that there still needs to be more research regarding the effectiveness of the SIOP Model. If given a longer time period to conduct the study there may be more opportunities for professional development to increase the fidelity of the model. Given the inherent complexities with changing one's teaching practice, it would be important for me to seek out expertise and training in how to use the model and then to practice with students in my own classroom. Additionally, it seems imperative that a sufficient amount time was devoted to training each teacher in the SIOP Model, before its implementation in the classroom. Regardless, there was modest growth present in student performance in classes using the SIOP model, especially when teachers were vested in the process. The findings of this study might also lead one to infer that because the treatments described were in effect not so much related to the specific content but more to the way the teachers used the SIOP Model to teach the content. Additionally, at the basis of these skills was finding ways to connect the academic vocabulary or language to the students' first language. Based on my own experience in the classroom, there seems to be a lot of parts of the SIOP Model that I could use in my own practice. The SIOP Model appears to have a number of strategies that would help ELL students access the content. Still further questions need to be explored in order to prove that this study could be generalizable to a larger population and different content areas. For example, would the study of produce the same results if tried with a social studies class? Also, these studies need to be tried on different language populations instead of just Latino speaking students to see if they have the same effects on giving access to the content.

**Critical Analysis 2: Embedding academic language.** Snow, Lawrence, and White (2010) drew attention to the use of embedding academic language throughout content for English language learners, in

order to prepare them state standardized tests. After reviewing various educational research, NAEP reading assessments, and by talking to educators in the field, the researchers noticed many language minority students in urban districts showed gaps in their academic English vocabulary. The also noticed native English speakers' vocabularies suffered due to a history of low reading ability. Snow, Lawrence, and White hoped that by introducing the *Word Generation*, program to educators, the researchers might be able to understand if embedding a set of 5 academic target words across content areas would improve ELL student's performance on class and state assessments. The researchers' goal was to understand how well students would learn targeted words after partaking in a vocabulary program.

Snow, Lawrence, and White (2010) conducted a study that showed that schools implementing the *Word Generation* program learned more of the embedded target words than students in the comparison schools. The authors defined target words as academic words that cut across content areas like analyze, construct, synthesize, or apply. They hoped that by employing this program, they would learn (i) how well students performed in contrast to the control group who did not receive the program. Additionally, (ii) they wanted to know if the effects were predominantly better for the language minority (LM) or English only (EO) students, and (iii) if improved vocabulary predicted an increase in scores on state-mandated standardized tests.

Eight Boston, Massachusetts middle schools 6<sup>th</sup> thru 8<sup>th</sup> grades participated in this quantitative quasi-experimental study. Roughly half the students were language minority and a vast majority of both treatment and comparison schools were from low socio-economic backgrounds. Five schools were given the *Word Generation*, component, while the other three schools received no conditional treatment and taught the students as they traditionally would on any other day. The researchers analyzed and compared data taken from pre and post vocabulary assessments of the eight schools. A secondary examination of groups, took place looking at improved reading ability on a state mandated English language arts assessment.

The treatment *Word Generation* program is a 24-week long sequence of current topics of interest, each associated with five overarching academic words and prescribed activities relating to science, math, and social studies. Each Monday, the students and teacher read a short text with that integrated the five academic words. This took place in the student's English language arts class. The teacher and students then discussed it using guiding comprehension questions. The readings all included a quandary or debate that presented opposing arguments. In this text the five words were highlighted and provided students with relatable contextual definitions. Additionally, on Tuesday, Wednesday and Thursday these same five words were embedded using related dilemmas in math, social studies, and science classes.

The *Word Generation* intervention was assessed using a 48-item pre and post multiple-choice test. Students in the schools implementing the program learned more of the targeted words than students in the comparison schools, even with the comparison schools performing higher at the beginning the study. The language minority students benefited more from the treatment than the English language only students. Furthermore these students performed higher on their curriculum-specific assessments, which was a strong indicator of how they would do on state standardized testing. The value in incorporating the *Word Generation* program seems to be its focus on effective, engaging, vocabulary-focused pedagogy. Overall, the data statistics show that the 20-22 weeks participants spent in the *Word Generation* program was equal to two years of related traditional classroom learning.

Snow, Lawrence, and White called attention to several aspects related to flaws in their studies design and method. The authors noted the schools that volunteered for the study ultimately new the general goal of the study. This may have influenced how the educators taught, while using the *Word*

Generation program, if the ultimate goal was to improve LM student's scores and assessments. For example, the teachers may have emphasized the targeted words outside the activities designed as part of the Word Generation program. Moreover, the pretests given to the participating schools did not all take place at the same time, due to the fact that it was hard to find volunteers for the comparison non treatment schools. Schools who did volunteer for the treatment were all schools with relatively high English language learner populations, of which would benefit highly from research. All the schools volunteered, which means there was no random sampling, so the ability to say this study was applicable to a broader population of learners is unfounded. Moreover, the pretests given to the participating schools did not all take place at the same time due to the fact that it was hard to find volunteers for the comparison non treatment schools. Schools who did volunteer for the treatment were all schools with relatively high English language learner populations, of which would benefit highly from research.

Furthermore, little information is given about the actual intervention except how it was used in each class, so that makes it hard to distinguish what adaptations the teachers were using. By not explaining the treatment, an outside observer cannot understand the value of the treatment and if parts of it can be transferrable to one's own classroom. For example, its possible teachers could have given students supplemental support materials to help in their acquisition of the five targeted word implemented in the Word Generation program. This makes the correlation between the Word Generation program and results not causal.

Another area that may threaten the internal validity is the chance of statistical regression. It is typical that students who scored poorly on the pretest might do somewhat better on the posttest. With that being said, it is hard to determine the chance of statistical regression with these students because retesting always produces a different distribution of scores. Lastly, because of the nature of the selection of the participants of this research study, results may be seen by outside observers as being predictable. The schools that jumped at the chance to be a part of the study all had large populations of language minority students from low socio-economic backgrounds that performed poorly on statewide testing. This makes it hard to measure the effectiveness of the treatment because teachers in schools with large language minority populations already had programs like *Sheltered Instruction*, that were curricular support systems for language minority students. It's possible that the reason a change in test scores at the comparison non treatment school was insignificant, due to the fact that they had less language minority students, and thus did not incorporate the same support programs like *Sheltered Instruction* into their school pedagogy. Therefore the gaps in improvement between the schools may be not correlational.

A positive aspect of this study is that the demographics (socio-economic populations and setting), of all the schools were basically the same so the test groups were basically equal in background and need. Additionally, the treatment was administered across content areas so its generalizable not to just one specific content area. Furthermore, the design of the study was a nonequivalent control group, which limits uncontrolled factors that could take place in the design such as history, maturation, testing, instrumentation, selection, and mortality. This means that there were not independent variables affecting the findings of the study like the experiences of the subjects changing from the beginning to the end. The same materials were used for pre and posttests in both experimental and control groups. This limits the bias related to the results because all participants were tested on the same material, so performance on the test could not be affected by independent variable within the text.

In my own experience I've often wondered how I can more effectively give language minority students access to the academic language needed not only for critical thinking skills in a social studies setting, but also how these skills may translate to improvement on class and state assessments. This study

certainly provokes thinking about finding ways to incorporate overarching academic vocabulary across content areas, which may help students understand critical thinking skills needed to be successful in academia. In addition, by creating contextual descriptions of the vocabulary that relate to the students prior knowledge, I can possibly create understandings at a deeper level. However, since a detailed description of the treatment is missing, it is hard to say if the Word Generation program is something, me or anyone else could readably transfer our own classroom. Still its notable for further investigation on how this program exactly embeds targeted academic vocabulary words throughout daily learning activities. Lastly, this study provokes thought on how scaffolding academic language may be instrumental in helping language minority students see content areas through critical thinking lenses, that help them better understand the material they covering in classroom activities.

**Critical Analysis 3: Embedding academic vocabulary.** Vaughn, Martinez, Reutebuch, Carlson, Thompson, & Franci (2010), conducted a quantitative study in order to examine the effectiveness of incorporating instructional practices associated with improved outcomes into middle-school social studies instruction, as a means of enhancing vocabulary knowledge and comprehension for English language learners. In these two experimental studies that covered a period of two consecutive school years, researchers sought to understand how a multi-component instructional routine could be developed to enhance effective outcomes for English language learners and in what ways can social studies teachers influence students' understanding of academic vocabulary and comprehension.

Vaughn et al. looked at two middle schools from the same district in central Texas, which had large English Language Learner populations. The four teachers chosen were randomly assigned to treatment and control conditions. Both schools were considered to have a substantial number of ELL students, who were designated by the school as having limited English proficiency. In the year after the completion of first experiment, one of the original schools and a new school from an alternate district in central Texas with large numbers of ELL students was chosen to participate in second study. It's important to note that the studies had non-overlapping samples.

Students in the intervention group received lessons that emphasized vocabulary instruction, the use of brief videos, purposeful discussion to build concepts, the use of graphic organizers and other writing activities to build comprehension or vocabulary through writing, and lastly structured pair grouping. The treatment took place 50 minutes a day, five day a week, for around ten to twelve weeks in a 7<sup>th</sup> grade social studies classes. Students in the treatment group were assessed both prior to and after the treatment with a content-based exam. The exam was designed to cover students' understanding of the content taught during a nine to twelve week period and was meant to serve as a gauge of growth in social studies learning.

Vaughn et al. gave an exam to the participants that consisted of vocabulary matching items and comprehension questions, and the questions were developed based on content in textbook and weekly quizzes. The vocabulary section had twenty questions that included definitions that had to be matched with vocabulary terms used within the context of a sentence that contained social studies information. The second part of the assessment included ten questions asking students to identify and explain concepts from the social studies units taught during the instruction. Analyses of pre-and post-vocabulary and comprehension performance were examined separately for each study.

The authors discovered that students who were limited English proficient outperformed their counterparts in the comparison condition on both the vocabulary and comprehension measures. In both study groups, ELL students in the intervention group were performing at significantly higher levels than ELL students in the control group post-intervention. Although this intervention was developed to address

the instructional and language needs of ELL students, the students who were not limited English proficient in the intervention classes also benefited. This means that the intervention could be beneficial to all students, making it even more important to consider for application in a broad range of classrooms.

Vaughn et al. attended to credibility of their findings by assuring that the same materials were used in the treatment and control group. The students had to cover the same material, over the same period of time, using the same textbook, providing students in each condition equal access to learning content and key vocabulary. Also, the same educators were used in both control and treatment groups. Therefore, the causation of independent variable outside that study should not be affected the outcome of the study, due to the fact that one can assume that the only difference between the two groups is whether or not they received the intervention. Any differences between the two groups may be attributed to the intervention with confidence in the validity of the research design. Additionally, despite the researchers, sampling method, which was purposeful, they did pick schools with large ELL populations and the number of classes picked seemed to be a large enough sample size to infer some generalizability from the findings. Though with that being said that population this study focused on was predominately Latino, which may have limited the ability of the treatment in this study to be generalized to all ELL students.

This study if anything seemed to reinforce the notion that perhaps at the root of all ELL instruction should be vocabulary. If students are given academic lenses through vocabulary, that may help them interpret new information, it may lead to an increase of their performance in the classroom. Additionally, the importance of connecting to student's prior knowledge seems imperative in this study. If I cannot assess what a student already knows whether in English or Spanish, then it seems improbable that I will ever be able to close the learning gaps in these students. Lastly, it seems apparent that in order to engage ELL students in social studies content they need to be taught to think like actual experts instead of novices. This is reinforced by Bransford's research on novice vs. expert thinking. Students seem to need to understand key concepts, patterns, and see academic language embedded in the issues associated with Social Studies in order to learn to think like historians.

That being said generalizability could not be truly known because the author's research only focused on one language minority group. Additionally, there wasn't a sufficient explanation of each tacit of the treatment, so that an outside observer would understand what the curriculum adaptations the study used to improve ELL students' performance. Without a better picture of what the actual treatment entailed, it is hard to say if there are enough variables to say the correlations presented in the study directly relate to the causality in the study. The researchers though seemed to make it apparent what the limits of their own research design was by pointing out regression factors related to their pre and post testing. Still one cannot ignore the fact that the students in the treatment group outperformed the students in the control group on all measures of their posttest. Lastly, because both ELL students and their English only classmates in the treatment group benefited from the intervention it meets the criteria for universal design, which I believe shows relevance to my own classroom. Furthermore, ELL's in the comparison group made the least gains and lagged behind all other groups on both the vocabulary and content comprehension measures. So, it does appear that the intervention provided further support to help ELL's perform better in class and on assessments. In order to further test the assertions put forth in this research, further research is needed into the interventions ability to increase achievement in other language minority groups, especially ones predominantly in the Pacific Northwest like Russian, Ukrainian, or Samoan. Though from my research, it seems that the adaptations to social studies pedagogy presented in this study would benefit my classroom because they correlate with interventions I have read about in various other studies.

**Critical Analysis 4: Language awareness.** Box and Kieffer (2013) conducted a study to investigate the multiple roles morphological awareness plays on influencing reading comprehension for Spanish speak language minority students (LM) and their native English (NE) speaking peers. This quantitative experimental study revealed that morphological awareness made a substantial and unique contribution to comprehension of content, as well as, had unforeseen influences on students' comprehension of academic vocabulary and word reading. The findings of this research validated prior research by verifying the overall importance of morphological awareness in literacy development for language minority learners. In addition, morphological awareness or lack of it may be a prime predictor of a student's ability to understand academic vocabulary and develop fluency in a new language. This analysis provided some tools for teachers in order to understand the specific linguistic skills influencing students reading and vocabulary comprehension.

Participants included 137 students recruited from sixth grade classroom in two K-8 schools in Arizona. Of these students 82 reported speaking Spanish at home and were classified language minority, while 55 reported being native English speakers. The participants appeared to come from mostly low-income backgrounds, though the absence of student level data due to state laws precluded the researchers from knowing the economic demographics of both sub groups. Box and Kieffer, hypothesized that (i) morphological awareness assists the development of academic vocabulary, which in turn facilitates successful comprehension. In addition, they hypothesized that morphological awareness may (ii) assist accurate and fluent word reading, thus liberating mental resources for comprehension. Lastly, they hypothesized the morphological awareness may (iii) forecast reading comprehension levels of a student from another country.

In order to test out their hypotheses, Box and Kieffer devised a series of measures to test the effects of morphological awareness on the participants of the study. All students received the same measures and were judged by the same standards. The first measure involved testing the comprehension of grade-level texts using the Gates-MacGinitie Reading Test, 4<sup>th</sup> edition (MacGinitie, MacGinitie, Maria, & Dreyer, 2000). The second measure tested derivational morphological awareness by giving students a (ii) non-word suffix choice task. This involved participants completing a sentence by choosing a nonsense word with an appropriate derivational suffix from among four choices. To marginalize the effects of decoding skills already inherent in students, the text were read out loud. Next, students understanding of academic vocabulary was assessed using a measure in which students (iii) choose a synonym for a given word on multiple choice items, based on a task used in prior research (Lesaux & Kieffer, 2010). Finally, a measure was designed to test word fluency by seeing if students could (iv) recognize printed words accurately and quickly. Students were provided with rows of unrelated words of increasing difficulty with no spaces separating them and then given three minutes to separate as many words as possible.

Box & Kieffer (2013) used Multivariate path analysis to investigate multiple simultaneous relations among variables of interest, while estimating both direct and indirect effects of morphological awareness on reading comprehension. Analyzing data, this way has several significant benefits over "multiple regression approaches" (p. 171). Typically, regression models only allow independent predictors for a single dependent result, but path analysis allows researchers to specify that one more variables are " simultaneously dependent variables in one relation and independent variables in another" (p. 171). Second, unlike regression models, path analysis permits researchers to estimate the importance and test the impact of indirect effects, which helps maintain the validity of the study findings.

Box & Kieffer found that morphological awareness had a substantial but small direct effect on the reading comprehension of the students. In addition, morphological awareness notably predicted a

student's ability to understand academic vocabulary and fluency, which in turn seemed to predict comprehension. Secondly, results indicate that morphological awareness makes a unique contribution to reading comprehension with both language groups not just solely language minorities. These findings converge with previous studies that used the same analytical approaches, included one study conducted with native English speakers (Nagy et al., 2006), and one conducted with Spanish-speaking language minority learners (Goodwin, 2010).

Box & Kieffer attended to validity by reviewing and building hypotheses based off large amounts of credible research from leading authors in the linguistic fields. Furthermore, the researchers went into a great deal of information about the testing instrumentation and its limits such as acknowledging the word reading efficiency measures were not exclusively intended to include derivationally complex words, which may have led to underestimation of the relation between word formation morphological awareness and word reading efficiency. In addition, the authors tended to statistical regression by using *multivariate path analysis* to convey their findings. However, although path analysis allows for the investigation of multiple direct and indirect relations at once, one cannot say the findings establish causal relation. That being said, it seems that further studies need to take place that incorporate other controls, such as overall language proficiency, phonological awareness, non-verbal intelligence, and syntactic awareness if this study hopes to be truly generalizable. Lastly, the studies sampling size while though purposeful, was large enough that by analyzing the empirical data I may be able to make some generalizable claims about the value of assessing a student's morphological awareness and adapting curriculum to help them increase it as a way to scaffold learning. Still the population being sampled was predominantly from a Latino background; so I cannot say if the findings would be generalizable to other language backgrounds that may not share the same Indo-European linguistic development as Spanish and English do together.

This study certainly provided some ideas for how I could analyze a student's morphological awareness, in order to understand how to support their acquisition of academic vocabulary. The value seems to lay inherent in finding commonalities between a student's first language and the new language they are trying to learn. By teaching cognates I can connect to students' prior knowledge of language and may be able to bridge students understanding of new words that are similar to words in the students' first language. Also, by teaching roots words, prefixes, and suffixes I may be able to help students create meaning from words, in a new language, or that they simply don't know, because they know what these linguistic devices mean. For example, by knowing the suffix *log* means to speak, I could assume the words *monologue* or *dialogue* had to do with speaking. Finally, in regards to my overall research question the findings of this study not only seem to suggest the key role morphological awareness plays in reading comprehension, but that it is also a key factor in a student's ability to develop a broad academic vocabulary. The development of academic vocabulary in turn seems to lead to better performance on class activities and assessments for language minority students. In addition, it should be noted that morphological awareness appears to directly affect English only, as well as, language minority students and because of that the findings of this study may be generalizable in a sense that they benefit all populations present in the classroom.

**Critical Analysis 5: Scaffolding historical thinking.** Zwiers (2006) conducted an action research study to better understand how to integrate and scaffold the development of academic language, content, and thinking in history classes for middle school non-native English speakers. This qualitative study revealed that in order to teach language minority students it is important for practitioners to focus on the critical thinking categories, the language that accompanies these categories, and their integration with the content goals. The researchers' analysis of multi-modal scaffolding strategies revealed a

framework designed to help students succeed on their assessment and helped develop their cognitive and communication skills. This analysis provides some tools for thinking about how to scaffold curriculum to meet the needs of students of which English is not their first language.

Zwiers investigated resources on historiography to identify critical thinking skills practitioners of history use with the hope of integrating them into his class lessons. The researcher also consulted the 6th through 9<sup>th</sup> grade California standards for history in order to create activities around the academic language based in around these standards. Furthermore, the author did a literature review of historiography literature to learn how historians think, in order to inform his thinking about how he planned to scaffold curriculum to get his ELL students to think the same way. What emerged was six dimension of historical thinking that seemed integral to student's ability to engage in the same critical thinking skills as a historian.

Throughout the five weeks of the study, the Zwiers worked to help the students understand the 6 dimensions of historical thinking, which were *causes, bias, empathy and perspective, effects, basic facts*, and the ability to *interpret, connect, and application*. In order to help students understand the six dimensions of historical thinking, Zwiers developed series of scaffolds that included visual aids, hand motions, simulations, group tasks, sentence frames, songs and one on one support. The first set of scaffolds revolved around language and thinking. The researcher began the first lesson by asking, "What is history?" then from student answers he (i) created a chant for remembering key points when studying history. From this chant in addition to texts, quotations, and video's the class mined historical vocabulary and created a (ii) list of brick words or words specific to history like *secede* and a list of mortar words which were academic expressions for abstract concepts like *outcome*. Next, the class (iii) created hand motions for many of the brick words that would help the students understands academic vocabulary, due to their lack of ability to speak English. This involved Zwiers creating hand motions that were associated with each of the dimensions. For example, bias was leaning over like a one sided scale, causes was a pushing motion, and empathy was pointing to one's heart These terms were then recorded on (iv) three wall spaces called the *History Vocabulary Bank* (for brick words), *Academic language Bank* (for mortar terms), and the *Figurative Chart* (for figurative expressions). The figurative chart was mainly used a resource to help students for non-English backgrounds understand expressions that's meaning may not translate to their first language.

Zwiers followed up these activities with a series of mini lessons that lead to a summative persuasive essay the student's wrote in order to show growth in the their ability to think like historians. In these mini -lessons the teacher/researcher modeled the use of thinking skills while going over various historical texts. For identifying an inferring causes and effects, students worked in pairs to build a pre-Civil War *cause* and *effect* timeline after watching the teacher model how to do one using Columbus as an example. To scaffold the skills and language of empathy and perspective the students watched a combination of video experts of the Underground Railroad diaries and did quick write responses to questions that helped them see the perspective of someone living in that time period. In order to teach *bias* to the students the teacher created an organizer on the whiteboard with the following columns; history, written, and winners. By discussing historical events with the students they were able to look at who wrote about the historical event and discuss what *bias* that person would have had while writing about the event they participated in during that time period. Students were encouraged to use mortar and brick words from their resource sheets. This also led the students to a discussion on the validity of primary and secondary resources, which may be important if students are expected to think like historians. Finally, Zwiers led a discussion around a historian's ability to *interpret, connect* and *apply*

history. The teacher connected student's prior knowledge by asking them why people write TV shows and movies and then connected that back to why people wrote about historical events. From this, students came to a greater understanding of history being able to teach people lessons, so that future people may not make the same mistakes in the future, or if it is a good lesson do the same things in the future.

During all these activities, Zwiers had the students record their thoughts and information in their historical logbooks. These logbooks provided a chance to have students experiment with new brick or mortar terms being used by their teacher, texts, and other students in the class. On alternating days the Zwiers checked in with students understanding of these words by pointing to terms on the wall and having students tell a partner what they meant and why they were important to history. This served a formative self-assessment that allowed the researcher to see where there might be areas of confusion.

When it came time to write the essay the Zwiers had to do a good deal of modeling and scaffolding because most students had yet to write more than a paragraph. As a warm up, students participated in an activity called *Pro-Con*. In this activity partners directed one another to quickly come up with pros and cons on chosen issues. While doing this activity, students were instructed to use transitions that they would be using while writing their persuasive essays. From there Zwiers gave students adapted persuasive essays about historical events or figures. Using different colored highlighters the students highlighted the hook, background information, thesis, supporting evidence, opposing arguments, and the conclusion, so that they could see the flow of how real historians wrote their papers. Furthermore, students identified brick and mortar words found on posters and their resource sheets in the professional essays. Then Zwiers and his students created a list of important features that would become the scoring rubric for the essay. Lastly, the students used the model essays to create posters of sample language commonly used in each element of the essay. This poster helped students see the patterns between historical essays they were analyzing. Finally, students drafted their own essays, taking material from their graphic organizers, using language from the walls, and responding to comments in their peer proofreading sessions.

After looking at student's logbooks, it appeared that students were producing questions based off the historical dimensions chart. In addition, by analyzing the student's logs and essays Zwiers was able to see the most commonly used brick and mortar words and realized that the common words were ones that were presented in more than one scaffold. Additionally, It appeared that when students were given somewhat freedom in what they wrote about, they in turn seemed more motivated to produce higher quality of work. It was also seemed clear from analyzing their work, that the student's ability to sculpt arguments seemed to greatly increase since the beginning of the intervention. Overall, most students seemed to exhibit "similar thinking processes and academic expressions, most of which were mortar terms" ( p. 329). A majority of the language the students used came from the posters with the sample languages written in different colors or from the academic language banks. Finally, Zwiers created a data table to show weak and strong areas of student writing, which might help him plan for future instruction. For example, the students seemed to be able to understand and express; *cause* and *effect*, taking on other perspectives, and comparisons. Yet, they still seemed to have misconceptions about a writer's *bias* and how certain lessons from history could be applied to present day.

Overall, In order to teach language minority students it seems important for my own social studies classroom to focus on the critical thinking categories, the language that accompanies these categories, and their integration within the content goals. The six dimensions mentioned provide a framework on which to integrate the academic language used in history, particularly the target mortar terms that described thinking and abstract relationship. The research study was quite informative. This

study's findings seem to suggest that there was an importance related to modeling and scaffolding during historical lessons, with high populations of language minority students. The students seemed to need to hear and see their teacher think aloud about history, in order to understand how to think like historians. Another possible implication was the role of authentic communication being used as tool to create learning. This seemed to happen by the students participating in a series of scaffolds and information gap activities. The need and desire to communicate appeared to be a driving force for students using more academic features of language. Another inference Zwiers made was the power of using assessment to shape the teaching of language and thinking. The researcher was able to monitor academic language growth and gaps by analyzing student quick writes, and by listening to group and pair activities.

As far as credibility goes, the researcher was also the teacher, so there was state of persistent observation. This benefits the study because they weren't just simply studying one microcosm of the classroom. Additionally, the researcher did participate in triangulation, at least theory and methodologically wise. The researcher consulted various research studies in order to understand what the professionals say about adapting curriculum to meet ELL needs. Also, he used the student's discussions, logbooks, and assessments to gather data instead of taking it just from one point. This seemed to help him see patterns in student thinking. I felt that there was confirmability in the researchers work because he provided vivid descriptions of how he analyzed student's work to collect data. Zwiers also provided data tables and supplementary material, so I could get an idea of what the different interventions were and how they were used.

A limit to the study was that there was not progressive subjectivity. This means there was no consultation with an outside observer to see if the conclusions the researcher were drawing are valid. Without checking in and a debriefing with an outside observer there could be no opposing arguments that might lead to questioning the accuracy of the researchers findings, which make his view of the research fairly one sided.

Overall, it's hard to say if this study was a predictable event because there were not multiple ELL cases described in which the treatments being used in the study were tested. Who's to say what worked in this class would work in any other class. So, it is hard to make any definite conclusions on the how integral these strategies were in improving students ability to perform on writing assessments unless the methods used in this research are tested with other populations of diverse speaking students. Additionally, it hard to say if enough time was spent doing the research. If the researcher had tried the same treatments on another unit, would he have the same outcome? Also, there was no pretest so it hard to say exactly where the students were academically before receiving the treatment, which in turn makes it difficult to show they grew in their abilities to think and understand history using English. All these issues lead me to realize that I need to further investigate the use of the six dimensions of historical thinking as a scaffold for writing. Without multiple cases and member checks it is hard to interpret if the findings have a basis for being applicable to classes elsewhere.

**Conclusion.** A careful review of five studies about adapting curriculum to teach students academic language has lead me to several conclusions. First, there seems to be an inherent value in understanding a language minority student's primary language, if as a teacher I hope to help them acquire academic language in English (Palmer, El-Ashry, Leclere, & Chang, 2007). Box & Kieffer (2013) helped illustrate how some languages have commonalities and patterns in their linguistic development and knowing these could help me bridge the gap between first and second language acquisition. Also, if a student's first language is not related in design to Indo-European languages then it seems important to analyze that language in order to see where confusion might present itself due to things like phonetic

sounds in words). By doing this I could hopefully better understand the barriers that might be present, in a student who speaks a language that's cognates, morphology, and phonology don't match up with English. Overall, this may in turn help with increasing a student's reading comprehension, which in turn which seems to affect their ability to understand academic language.

Secondly, another pattern that seemed to emerge was the importance of embedding academic vocabulary words across content areas (Snow, Lawrence & White, 2010). Students may need to see and use words that have applicability in different settings. For example, one can analyze or distinguish in math, science, social studies, and English. So finding ways to work with designated grade levels to embed target academic words seems imperative to create deeper understanding and access to new content.

Next, it seemed apparent after reviewing these studies the overall importance of scaffolding for language minority students. This includes lesson preparation, comprehensible input, strategies for learning, engaging interactions, practice & application, lesson delivery, and review and assessment (Echevarria, Richards-Tutor, Canges & Francis, 2011). If I hope for students to understand academic vocabulary, I might need to first assess student's prior knowledge and language abilities, in order to build on them to create new understandings. Additionally, I may need to give students opportunities to work with one another, in engaging in the kind of activities professionals do, if I want students to truly understand how to use academic language in it's appropriate setting (Zwiers, 2006). For example, instead of simply giving a student the definition of analyzes in their first language and new language, I instead have them work actually analyzing a primary document. This appears to create a lasting meaning because students will be able to visually see how analysis works. Lastly, English learners may need to revisit key vocabulary and concepts, and I as a teacher need to use frequent comprehension checks throughout lessons as well as other informal assessments to measure how well students understand and retain the information. Each lesson should wrap up with some time for review and assessment and time to determine whether the lesson's objectives were met (2006).

Furthermore, there appears to be a need for emphasizing explicit teaching of learning strategies to students so that they know how to access and retain information related to academic vocabulary and beyond. Good reading comprehension strategies, for example, may need to be modeled and practiced, one at a time with authentic text ( Echevarria, Richards-Tutor, Canges and Francis (2011). A good example of this is the SIOP Model, which requires teachers to scaffold instruction, so students can be successful, beginning at the students' performance level and providing support to move them to a higher level of understanding and accomplishment (2011). This means I may need to ask critical thinking questions as well so that students apply their academic language skills while developing a deeper understanding of the subject.

Overall, these studies offered some valuable strategies I hope to incorporate into my pedagogy in the future. First, there might be value in assessing a student's first language background if as a teacher I hope to adapt curriculum to meet his or her needs. This involves understanding their cultural experiences and the status of the development of their first language. By doing this I can find access points for them to better understand academic vocabulary. Once they start to comprehend the context of how academic vocabulary is used, students can then begin to use it in their writing and speaking. Secondly, I want to start using the SIOP Model as framework for scaffolding all my lessons because it seems to not only have value in helping language minorities comprehend classrooms learning, but also it appears to benefit English only speakers as well. Lastly, I want to create kinesthetic strategies for scaffolding, so that I have a visual resource to communicate key academic vocabulary and concepts to students during a classroom activity. This might help language minority students from different languages communicate with each

other visually instead of verbally, if they are lacking the skills to do so in class. Still there are limits to my overall understanding of language characteristics of different cultures and how to assess patterns in them that could possibly be connected to English language instruction. Therefore, further investigation needs to take place into understanding the direct role linguistics plays on comprehension of academic language. I plan to investigate this aspect by reading more research articles about it and by talking to language minorities present in my class. Once I know their backgrounds I can take some of these strategies and try them out to see if they are truly transferable to my own classroom.

## **Strategies for Differentiating Social Studies Curriculum for English Language Learners**

*by Marisa Bateman*

During my research, I delved into answering the question of what are best practices for differentiating reading and writing instruction and activities for ELL students in the social studies classroom. Social studies require proficiency in reading and writing in the English language. This relates to our overall group rationale, as I am still focused on differentiating for ELL students. Many social studies texts contain complex sentences, use of the passive voice, and extensive use of pronouns (Fry, 2007). Furthermore, social studies curriculum is moving more towards the incorporation of primary sources such as historical documents, letters, diaries, political cartoons, maps, and photographs. The work asked of students in deciphering and analyzing these primary source documents can often be difficult for ELL students, as it asks them to do higher level thinking with documents they may have trouble comprehending.

Another barrier to an ELL student's access to social studies curriculum is a rudimentary understanding of the cultural context in which social studies knowledge is constructed (Cho, 2008). Concepts that a student born in the U.S. knows through enculturation may be completely foreign to an immigrant student. Unfortunately, reading from the textbook does not always provide an ELL student with the background knowledge needed to understand new information and concepts. In social studies texts, facts and details are often condensed and textbook authors often omit the type of concrete or anecdotal detail that can help ELL students relate to unfamiliar concepts from their own experiences.

I chose this area of study due to the struggles I had in meeting the needs of my ELL students during my fall student teaching. Although I modified assignments and grading, but it was not with a solid understanding of how the modifications would best support ELL students' learning. I wanted to look more specifically at how to alter instruction and assignments to best meet the needs of ELL students so that they can gain the skills understand social studies content. Finding ways to better support reading and writing for ELL students will also help me to gain a better understanding of differentiating instruction for all students. Many of the accommodations I can make for ELL students will help students with other learning needs who need support with reading and writing.

I believe this research is important to the educational community because of the diversity found in most American schools. I think it is important to consider how to best scaffold for non-native English speakers, so that they may have access to the same educational opportunities as their peers. These strategies can help provide answers into closing the opportunity gap and give ELL students a better chance at college and career success. It is also important for the educational community to consider how to best meet the needs of ELL students in the social studies classroom because of the content taught in the subject. Social studies is where students learn about citizenship, culture, and human rights. These

concepts are important for students to understand so that they may become critical thinkers and active participants in American society.

To find relevant research surrounding differentiating for ELL students in the social studies classroom I used research databases provided by the Evergreen State College Library. These databases included JSTOR, Ebscohost, ERIC, and ScienceDirect. I performed keyword searches, narrowing my focus to studies that all surrounded ELL students or limited language proficiency and social studies. I ensured that all of my studies focused on secondary students, as this is the population of students I plan to teach in the future.

I tried to find studies that were both qualitative and quantitative, so that I would have a larger range of information to draw conclusions from. I specifically looked through studies that discussed strategies for reading and writing. I wanted to find ways in which teachers are using successful practices to scaffold these types of activities because they are the most common ways for students to learn new information and demonstrate their understanding in a social studies classroom. However, one of my studies focuses on ELL students' social studies comprehension through an oral history project. I included this study in my research because I had not previously considered how ELL students can benefit from speaking and listening type activities.

**Critical analysis 1.** Fry (2007) conducted a study to better understand how middle school students' reading comprehension was impacted by reading social studies texts online with a pop-up dictionary function for every word in the text. This experimental study found that the pop-up dictionary reading was a statistically effective method for improving student test scores. In the analysis of overall student scores, it proved to be clearly superior to a traditional text reading method for three of the four testing sequences and superior to the online reading method for two of the three testing sequences.

This study shed light on supporting reading comprehension in a middle school social studies classroom. The specific focus on textbook support is especially relevant, as many social studies classrooms at the middle level are textbook based. The research is focused on a specific reading intervention, pop-up dictionaries, which could be an easy intervention for differentiating instruction. Textbooks rely on expository writing, which can be difficult for struggling readers to understand.

One hundred twenty-nine middle school students from a rural, working class town participated in this investigation. The town's economic infrastructure was based on a waning industry and as a result the school district was experiencing declining enrollment despite an influx of ELL learners from Russian and Spanish speaking countries. More than 37% of the school district's population came from low-income homes. Four class sections each of sixth, seventh, and eighth grade were selected for possible participation in the study. 37 sixth graders, 33 seventh graders, and 59 eighth graders were chosen to participate. Participation was voluntary and no incentives were provided.

The students in the study were assigned to one of four sequences of readings. Each student took a test consisting of two parts (referred to as Part A and Part B) with 10 questions per part after each reading, over a total of two or three testing periods. Part A consisted of comprehension questions presented in multiple-choice format. The questions addressed students' comprehension of main ideas from the chapter. Part B consisted of cloze test items; the passages were taken directly from the texts students read prior to taking the test.

Each grade level teacher selected three sections from the class textbook for use in the study. Two readings were converted into electronic format; one of the electronically formatted texts was equipped with the pop-up dictionary. The pop-up dictionary used definitions that were written at the sixth and

seventh grade reading level; 100% of the words in the text had pop-up dictionary definitions. The tests were completed in pencil and paper for all three readings.

The study design was well researched and planned. Fry (2007) gave detailed descriptions of the demographics of the school, their selection process for participants, and their data analysis process. By randomly assigning students to treatment groups, the researchers strengthened the internal validity of the experiment. The data analysis for the study was done using a specific program, outlined in detail by the researchers. Three separate crossover analyses were performed to determine whether the reading types had statistically significant effects on test scores.

The researchers concluded with considerations for the necessity of future studies over a longer period of time. These studies should include high-stakes state reading assessments to measure effectiveness are needed to demonstrate the long-term feasibility of pop-up dictionaries as an intervention for struggling readers. The success of pop-up dictionaries should also be studied at the elementary and high school levels as well as in additional content areas. Something that would have also been beneficial to know was the different language of the ELL students participating in the study. There is an assumption that they were Russian and Spanish speaking students, based on the demographics of the school. However, this was not made explicit in the study. By having a larger range of languages spoken, it would be easier to say that this intervention could be successful for all ELL students.

A pop-up dictionary would be a fairly easy intervention to implement in the social studies classroom, provided that a teacher has access to computers. While it is unrealistic to expect a pop-up dictionary to provide all the assistance necessary to help ELL students and other struggling readers reach grade-level proficiency, the results of this study are promising enough to suggest that pop-up dictionaries offer one path to improving reading comprehension. While vocabulary is often taught in the social studies classroom, it is specific to a unit or lesson. ELL students might need additional support with vocabulary that many students are assumed to have an understanding of coming into the classroom. By offering a vocabulary intervention that is easy and accessible for all learners, students can take initiative in improving their understanding.

**Critical analysis 2.** Haneda (2009) explored the learning opportunities provided for ELL students and the discursive strategies used by a teacher to help the students become increasingly competent members of the class. The researchers wanted to know how the teacher discursively helped ELL students to understand key concepts, as well as what ELL students learned over time through their socialization into this classroom's practices. Despite her lack of formal training in teaching ELL students, Ms. Brent (pseudonym) was observed to use many of the strategies recommended for sheltered instruction, including writing information on the whiteboard (in addition to giving an oral explanation), speaking slowly, repeating information, and using visual aids. Another characteristic of Ms. Brent's instruction was that she recapitulated important information, interweaving it throughout the unit. The researchers also found that learning in this class was not simply about the curriculum content, but was equally addressed to students' becoming competent participants in the classroom community and developing dispositions as responsible members of society.

This study is relevant to my research question because it focused on a particular teacher's interventions in a social studies classroom to improve ELL engagement and comprehension. As I am searching for ways to better support English Language Learners' social studies comprehension, this study could have provided me with differentiation strategies. This study also shed light on what a sheltered classroom is. This term came up more than once in my examination of research for this project, leading me to believe that it was an intervention used to meet various ELL student needs.

The case-study teacher, Ms. Brent had taught social studies at the middle school level for over 10 years. At the time of this study, Ms. Brent was teaching 7<sup>th</sup> grade social studies in a suburban school district in a US Midwestern city, located in a middle-class neighborhood. Ms. Brent was chosen for this study due to her experience in working ELL students. Ten percent of the students at the school were designated 'limited English proficient'. Because of the presence of a prominent Japanese automobile plant in a nearby city, schools in this district, including HMS, have a high proportion of Japanese ELL students. ELL students, including those with little English competency, attend mainstream classes from their first day of school, a common practice among other suburban school districts near HMS.

The data to be reported were taken from a larger ethnographic study conducted in social studies classes over two academic years (2006–2008). In the first year, over one semester (September 2006 to January 2007), the researchers made twice-weekly visits to two 7<sup>th</sup> grade social studies classes— sheltered and mainstream. They observed and videotaped these two classes and wrote extensive field notes. The researchers also revisited the sheltered class in May 2007 to collect additional data. In the second year, in consultation with the teacher, the researchers selected several units for intensive study in order to capture the cumulative nature of learning over time. In total, the data collection consisted of approximately 85 hours of video recordings of classroom interaction with accompanying detailed field notes about each class session. Other types of data collected included transcribed interviews with the teacher, students, and school personnel, as well as classroom artifacts (e.g. worksheets, tests).

The research design was clear, as the researchers state their background research and what lead them to their research questions. In the beginning of the paper, Haneda (2009) states that they hoped to demonstrate how this teacher conceptualized her units and attempted to organize her teaching to meet the needs of the particular ELL students in her care. There seemed to be thorough documentation and analysis of two different social studies units in Ms. Brent's classroom. The research was done over a two year period, giving the researcher a lot of material to analyze and draw conclusions from.

The researchers focused specifically on interactions with ELL students, and how they responded to the different strategies. The researchers highlighted on both the strengths and weaknesses of the teacher, finding areas for her to improve on when working with ELL students. The researchers noted that the teacher recognized deliberate focus on the development of academic language as requiring further work. The researchers believe that a way to develop a better understanding of academic language is through a linguistic analysis of social studies textbooks and other relevant books to see how history is constructed in and through language.

From this study, I gathered that sheltered instruction is an approach to teaching ELL students, which integrates language and content instruction. The focus is not on providing less content for ELL students, but to assist with language acquisition. Therefore ELL students are held to the same standard as native speaking students but are provided additional support in comprehending the material. I found it interesting that in this study Ms. Brent does not refer to her classroom style as sheltered instruction. Instead, the researcher labels it so because efforts are made to make grade-level academic content more accessible to ELL students through various instructional strategies.

The sheltered classroom instruction can help me find ways to better support ELL students in social studies. It can allow me to provide the same content to all students, but differentiate throughout my instruction so that ELL students reach the same learning targets as native English speakers. The strategies highlighted in the study are also easy to incorporate in the classroom. For example, a teacher gives directions both verbally and in writing. They check in with the ELL students, ensuring their understanding of the task. I think sheltered classroom instruction forces a teacher to have a broader

conceptualization of what counts as learning. It also forces the teacher to consider what concepts and skills are necessary for students to acquire from social studies.

One of the biggest things that resonated with me from this study was that the teacher created a learning environment where the ELL students were not only heard, but were seen as valuable contributors in discussions. The teacher made ELL students' contributions salient by reiterating or reformulating them, ensuring they were heard by other students and incorporated into classroom knowledge-building. The teacher treated her ELL students as capable individuals with bilingual resources and unique life experiences who happened to be in the process of learning the language of instruction. This belief is one worth further study, as I would like to know more about incorporating ELL students' experiences into the social studies curriculum. ELL students could provide an alternative viewpoint for discussions around social studies concepts, as they have most likely lived different experiences than those born in the country.

**Critical analysis 3.** Vaughn et al. (2010) conducted two quantitative studies that examine the efficiency of incorporating instructional practices associated with improved outcomes into middle-school social studies instruction as a means of enhancing vocabulary knowledge and comprehension for English language learners. Two experimental studies in two successive school years with non-overlapping samples were conducted. The classes were randomly assigned to treatment and control conditions. Students who were limited English proficient outperformed their counterparts in the comparison condition on both the vocabulary and comprehension measures. In both study groups, ELL students in the intervention group were performing at significantly higher levels in reading comprehension than ELL students in the control group post-intervention. Although this intervention was developed to address the instructional and language needs of ELL students, the students who were not limited English proficient in the intervention classes also benefited. This means that the intervention could be beneficial to all students, making it even more important to consider for implementation.

This study shed light on instructional routines developed to enhance effective outcomes for ELL students in vocabulary and comprehension. This study can help guide me in finding ways to assist students in reading comprehension, specifically surrounding vocabulary. This study also looked at improving vocabulary through writing exercises, which can help me to determine practices that might improve ELL students' writing.

Two middle schools from two districts in central Texas with large numbers of ELL students were chosen for this study. Two different non-overlapping samples of classes of 7th grade students were randomly assigned at the classroom level to a social studies intervention or to control comparison groups. In the first study, participants were drawn from two middle schools in the same central Texas school district. Both schools were considered to have a substantial number of ELL students who were designated by the school as having limited English proficiency. In the year after the completion of first experiment, two middle schools from two districts in central Texas with large numbers of ELL students participated in second study. Only one of the schools had also participated in the first experiment.

The social studies intervention was comprised of vocabulary instruction, the use of brief videos and purposeful discussion to build concepts, the use of graphic organizers and other writing activities to build comprehension and vocabulary through writing, and structured pair grouping. Students in the treatment classes received the intervention during their regularly scheduled seventh-grade social studies class. The intervention was implemented for 50 minutes a day, five days a week for approximately nine to twelve weeks.

Prior to the intervention and after its completion all students were assessed with a researcher-developed content-based exam. The exam was designed to cover students' understanding of the content taught during a nine to twelve week period and was meant to serve as an indicator of growth in social studies learning. The exam consisted of vocabulary matching items and comprehension questions, and the questions were developed based on content in textbook and weekly quizzes. The vocabulary section had twenty questions that included definitions that had to be matched with vocabulary terms used within the context of a sentence that contained social studies information. The second part of the assessment included ten questions asking students to identify and explain concepts from the social studies units taught during the instruction. Analyses of pre-and post-vocabulary and comprehension performance were examined separately for each study.

An advantage to these studies is that teachers were the same for both of the conditions and students in both the treatment and control conditions covered the same material over the same period of time using the same textbook providing students in each condition equal access to learning content and key vocabulary. Another strength of the studies is that the studies were randomly assigned to different treatment and control groups. This helps to improve the validity of the study, as students did not choose their assignment groupings. If subjects are randomly assigned to receive a treatment or not, then one can assume that the only difference between the two groups is whether or not they received the intervention. Any differences between the two groups can be attributed to the intervention with confidence.

The studies only seem to focus on interventions with Spanish speaking students, as at least 65% of the population at both schools was Latino. I will most likely be working with more diverse ELL populations, and need interventions that could apply to all students. While results were found to be successful across all students, I would have more confidence in the study if there were diversity between the ELL students. Having this strategy work for students with different language backgrounds will demonstrate that this strategy is applicable to a wide-range of ELL students, not just native Spanish speakers.

Something I found beneficial and important to note from this study was that the researchers examined the effects of an enhanced social studies instruction designed specifically for students who are ELL students that would benefit all students. These interventions were not just ones that differentiate learning for a particular group of students in the class, but rather looked at improving comprehension for all students through the lens of what would best support ELL students. I think this mindset is important, as it considers strategies that could best support all learning needs. It puts differentiation at the heart of a lesson, rather than a consideration after developing the content and activities.

**Critical analysis 4.** Salinas (2008) conducted a qualitative case study of a high school social studies teacher's interventions to better support late-arrival immigrant students. The researchers found that the teacher adapted her instruction with sheltering practices such as using graphic organizers, hands-on activities, language and content objectives, and critical thinking questions. Additionally, she valued prior learning from home, school, and community as a strong foundation to build new content-area knowledge in geography lessons. Mapping and other distinctive world geography activities revealed more than the spatial dimensions of human experience and were overt pedagogical practices used to create an understanding of the people, places, history, and current events most relevant to late-arrival immigrant students.

This study sheds light on how a teacher's interventions for late-arrival immigrants. None of the other studies I have examined focus specifically on this group of students, but rather ELL students in general. Late-arrival immigrants provide a variety of challenges, especially in having the background

knowledge necessary to comprehend social studies concepts. While this study focused on a geography class, I felt that some of the strategies used in the class could translate to more broad social studies curriculum.

Prior to this study, the researchers examined social studies practices at late-arrival immigrant high schools in Texas and Colorado. Although differences in staffing, contexts, and resources were apparent, each school's overall intention was to help ELL students acquire sufficient academic proficiency in the content areas. The researchers decided to focus on a social studies teacher at Santa Ana High School in central Texas. The subject of the study was a social studies teacher who had been teaching for eight years and was certified in ESL instruction. The teacher, Ms. Davila, was purposefully selected for the study for several reasons. First, she understood the instructional decisions that were instrumental in helping late-arrival immigrant students' transition into mainstream English-only high school classes. Second, Ms. Davila had an understanding of the instructional approaches that engage students in a more inclusive conceptualization of the curriculum.

The researchers studied a social studies teacher's practices through interviews, classroom observations, and a collection of various artifacts (e.g., district documents, lesson plans, and student work). This case study allows a lot of detail to be collected that would not normally be easily obtained by other research designs. The researchers went in great depth over the practices used by the teacher, and students' responses to them.

World geography education not only creates academic English learning opportunities for late-arrival immigrant students, it also honors and authentically integrates multicultural identities into the curriculum. In the social studies classrooms, late-arrival immigrants highlight the intersection between citizenship and language, culture, and legal status and thus provide teachers with an opportunity to challenge oppressive histories of privilege and dominance. Historical geography can also make relevant connections for late-arrival immigrant students because it provides a valuable chronology of migration movements and patterns that are inclusive of multiple ethnic groups.

There was a strong focus on geography in the researchers' conclusions, which can make translating the results of this study to many social studies classrooms difficult. From my experience, many social studies classes focus more on history and civics, giving little time to geography. OSPI standards for social studies in Washington State enforce this discrepancy as well. There are significantly less standards on geography than the other social studies concepts. Due to this, the successes of the study might not be applicable to all social studies classrooms.

**Critical analysis 5.** McCullough et al. (2013) conducted a mixed-methods study examining the effects of a Bilingual History Fair (BHF) where 4th–12th grade, recent immigrant students investigated their communities and immigration histories. The exhibits the students produced for the BHF were designed to support the students' learning of English while gaining knowledge and an understanding of local community, immigration and history. The researchers found that student involvement in the history project expanded student learning and understanding of historical concepts. Through this initiative, teachers validated the students' languages, cultures, and life experiences of their families. The student and teacher interactions as well as the employed targeted instructional strategies were key methods to moving ELL students toward a stage of historical thinking that have a measurable impact on student progress in the social studies.

The study took place in 14 Chicago Public Schools and three schools in surrounding Chicago suburban school districts. While there were 51 participating teachers involved in the Bilingual History Fair, 37 participated in the study. The teachers included in the study included all grades, with six of the

teachers from the high school level. These teachers spoke twenty different languages. The languages that the teachers used for classroom instruction also varied. Fifteen of the classroom teachers used Spanish and English with their students, eight used English-only instruction. The remaining teachers used their students' native languages including: Chinese, Polish, Bosnian, Mandarin, and Cantonese.

The 149 participating students at the BHF represented fourteen different languages. These languages included Amharic, Arabic, Bosnian, Chinese, Gujarati, Hindi, Polish, Romanian, Serbian, Spanish, Tagalog, Ukrainian, Urdu, and Vietnamese. 78% of the student respondents were from elementary or middle schools. Of the 22% that were high school students, seventeen were in 9th grade, thirteen were in 10th grade and four of the participating students were in 11th grade.

Under the supervision of their teachers, the students spent one to three months working individually or in groups. They created research projects centered on local family, and/or community history, with use of primary sources online and research at community centers. Students then presented their projects at the subsequent Bilingual History Fair. Differing from a competitive history fair, the BHF focused on content learning and English language development. The BHF gave ELL students the opportunity to exhibit their projects while addressing the following historical questions: "Who am I? Where do I fit in? How did my world get to be this way? How have others built a new life and community here in Chicago? What affect has my language and cultural community had on the city of Chicago?" (McCullough et al., 2013). The BHF also required ELL students to delve into historical thinking and critical thinking processes, while gaining greater content knowledge of United States' Social Studies.

This study shed light on strategies for teaching social studies that would engage ELL students. Many aspects of the project required students to use reading and writing skills. This study offers some ideas for engaging students in social studies that I had not previously considered, such as utilizing speaking skills. By looking at different techniques for engaging students in social studies curriculum I am gaining a larger set of skills for assisting ELL students.

The mixed-methods research allowed the researchers to pull a variety of information to inform their conclusions. This included surveys of teacher participants, two teacher focus group interviews, and pre- and post-data collected from student participants. Mixed-methods focuses on research questions that call for real life contextual understandings, which makes the conclusions use both qualitative and quantitative information. The qualitative piece of this study was similar to that of a case study, following and observing the teachers and students in their preparations for the Bilingual History Fair. The quantitative aspect analyzed pre and post-performance data to look for student improvement.

Students were not placed in treatment and condition groupings, so nothing could be compared to. Therefore the information in this study should be viewed more for transferability rather than generalizability. With that said, this project could be difficult to recreate in a school or district with a smaller population of languages spoken. This project would also need funding and support as it was such a large-scale assignment.

While this study highlighted some techniques that might be difficult to apply to every classroom, there is value in developing social studies curriculum and assignments that allow students to make cultural ties with historical thinking and practices. As a result of the effective social studies instruction, the students in this study were learning, taking pride in their academic development, and increasing their understanding of the key social studies concepts. This project also allowed students to create a connection between their cultural background and the classroom. Incorporating students' languages and cultures into the learning opportunities validated ELL students' life experiences and enhanced their sense of place in the school and community.

**Conclusion.** From these studies, I have found that there are a variety of strategies for differentiating instruction for ELL students. One of the most important things to consider is how to make reading comprehension easier for students. So much of what is asked of students in social studies is related to reading (Vaughn et al., 2010). Reading different texts, analyzing sources, and using evidence to support and argument are all reading related skills that are essential to the study of history. By scaffolding reading comprehension, I can better support students in understanding content. Something to consider is how to help students with vocabulary comprehension. The suggestion by Fry (2007) of using an electronic pop-up dictionary is good, as it is an easy to use application. It also gave students access to the language they needed to comprehend the social studies curriculum. However, it will also be important for me to consider other vocabulary strategies that do not use technology, as I do not know the access I will have in my teacher career.

Another aspect to consider is developing inclusive differentiation strategies that will benefit all student learning, not just ELL students. If effective instructional practices for ELL students also benefit native English speakers, I have a strong rationale for implementing the instructional practice because it will benefit all learners. This will help me to hold all students to the same high standards, yet create access points for a variety of learning styles. It will also help me to create a learning environment that focuses on student growth and understanding, rather than student ability.

Finally, social studies curriculum will be more engaging for ELL students if it is something that they feel a personal connection to. Students from different countries will sometimes find it difficult to study the history and culture of places that are unfamiliar to them. By creating assignments that create connections between different cultures, I am providing students with meaningful work. It also helps me to create an environment where these students feel as though their work is valued in the classroom. ELL students will be contributing something to the discussion that native students cannot.

This spring, I plan to incorporate what I have learned here about differentiating instruction so that all learners benefit. I think if I consider differentiation strategies before I create the lessons, I will be using good practices more as a habit, rather than a second thought. I plan to use such strategies as giving verbal and written directions, assisting with vocabulary comprehension, and providing visual aids. I would also like to incorporate a project this spring that allows students to explore social studies in a way that is personal and meaningful to them. Something I really took away from both the Salinas (2008) and McCullough (2013) studies was how strong student engagement was when students could make social studies connect to their personal lives. Providing students with work that connects their experiences and culture to the curriculum will create the space for students to taking pride in their work, as well as create a connection between their school and their community (McCullough et al., 2013).

In the future, I would like to research more about scaffolding writing for ELL students in social studies. This was a part of my research question, yet my studies focused more on reading comprehension. I think there are things implied with the reading strategies that could benefit writing, as the two subjects are closely related. Yet I want to find studies that are more implicit with strategies for writing. The types of writing asked of studies in social studies, such as analytical and argumentative, can be difficult for ELL students. These types of writing ask students to infer and draw conclusions from the content, which can be difficult to do if you are having trouble comprehending what you are reading. Providing structure to better understand how to develop these skills will be beneficial in not only their writing, but in their development of critical thinking.

Something I also kept coming back to while researching this subject was how significant social studies is in improving skills that students are being assessed in. Using social studies to help increase

student reading comprehension helps to show the value these classes have in schools. Social studies is a content area that has been considered by some in education as unnecessary, and should be considered an elective. However, social studies gives students an opportunity to practice and improve their reading (Brooks and Thurston, 2010). Social studies requires students to read a variety of texts and draw conclusions from their readings. These skills are also used in English Language Arts, as well as are addressed by Common Core State Standards. I would like to do research more in the future about reading comprehension strategies in English Language Arts and compare them to what I have found with this body of research. Some of the strategies may overlap or be applicable to different content areas.

## **Differentiation Strategies for Unmotivated Students**

*by Michael Crouch*

My research question relates to our group question, but focuses on a different type of student. The research that I have looked at focuses on differentiation, like the research conducted by my research group, but pertains to students who are unmotivated and/or underachieving. Differentiation, as it will be discussed in this review, is the purposeful decision made by a teacher to provide different ways for students to reach their learning targets based on their learning styles and profiles. Unmotivated and underachieving are terms used to describe students who are capable of high levels of production, but for various reasons are producing below their abilities. The main question that I want to focus on is “How can we, as educators, best differentiate instruction in a way that addresses the needs of unmotivated and/or underachieving students in order to maximize their learning?”

I examined studies around the topic of differentiated instruction in ways that give unmotivated students access to the material. These studies range from quasi-experiments to case studies, all of which show the different ways that differentiated instruction can help students who struggle to stay motivated and engaged. The studies, although they are all different, help to inform my question of how to effectively differentiate for the benefit of underperforming students.

In recent years, the question of how to effectively teach the increasingly diverse group of students in our classes has become a frequent discussion that is at the heart of meaningful instruction. There are increasing amounts of students who come from diverse backgrounds and cultures. Differentiating instruction is emerging as a very plausible response for this question. It allows us to treat each student’s needs as important and gives us the chance to facilitate each student’s success.

Each class also has students who are underperforming. This underperformance is happening for a variety of reasons. Students come to class with a variety of preferences and learning profiles that are not considered by teachers, so the ways they would learn best are ignored. Additionally, teachers tend to focus on students with language barriers or other learning disabilities, while the unengaged students stay unengaged because teachers are not using strategies to give them access (Servilio, 2009). The literature also suggests that the students should be given choices, a practice that will help them feel motivated to learn (Stanford, 2009). The studies that I have examined and my research group has examined show that there is a need for differentiation and they also show ways that it works. The repeated theme in these studies is that students end up benefiting from the differentiation and gaining more access to the material. Within the focus of our group question, I have started with the question “How can I best differentiate instruction in a way that addresses the needs of underperforming students?”. I will be examining ways that we can differentiate underperforming students in order to meet their learning needs, motivate them to

contribute maximum levels of effort, and perform at their highest level possible. I have seen through my research that students benefit greatly from differentiation.

This field of research is very important to the educational community because all students are different and deserve a differentiated approach that matches them. This being said, the student body nationwide is becoming more and more diverse every day. There are new immigrant families arriving and being connected to local school districts. Culture groups of all different types have representations in schools. Students also bring with them their backgrounds, home lives, and learning needs each day to school. Delivering one mode of instruction in school does not make sense anymore. Teachers need to learn about their students and their learning needs. We need to diversify our instruction in ways that encourages and facilitates learning for all. It is worth researching.

Furthermore, there is a need for motivating the underperforming students in our classes. This is becoming necessary because students' learning styles and preferences need to be accessed. Whether we approve or not of students who do not reach their potential, the fact is that there is a reason for it. Perhaps the student has been put down and discriminated against by leaders in a school system or has a home life that prohibits learning. Perhaps the student has a learning disability or a special talent that requires them to pursue a different learning approach. Many of these factors go unnoticed. As teachers, we have a choice to let that student slide by and fail or investigate the matter and figure out a way to get them to succeed. There is an enormous need to motivate these students and there is research to guide methods of differentiating instruction for them. This will help students in the public school classroom greatly. Authors such as Tomlinson and the authors of the research reviewed in this paper have shown that differentiation can be of great benefit to students in various class settings.

In order to find and review research in this field, I used JSTOR, EBSCOHOST, and ERIC to search for studies and articles. I searched using the following terms: "differentiated instruction" as well as "differentiated teaching", "underperforming students", "underachieving students" and "unmotivated students". I then looked at the results and carefully chose studies that were relevant and valid that I could access.

The findings in all the studies showed that differentiation served to motivate students who are underachieving and helped to improve their performance. The studies tended to reveal information that is narrow in scope and is thus difficult to use in answering my question. Most of the studies use a small sample of only one type of school or age group. Many others uncovered the findings of specific interventions that a school district was thinking about using as interventions. Overall, the findings in the research were related to my question and helpful in my search, but further investigation needed to be conducted in order to answer my question conclusively.

**Critical analysis 1.** Eichert (1995) conducted a study in which she attempted to discover the effects of implementing a type of differentiated instruction in a school in the Eastern United States. The researcher wanted to address the needs of the underachieving students in the school. Her goal was to use analyze the difference in the performance of the students once the treatment was given and the differentiation was in place.

The researcher found that when instruction was differentiated and adjusted according to students' interests, the students were much more likely to engage in the material and their grades and performance on assessments improved by a great margin. The students who were given a choice in what activities to participate in and how to practice with their peers showed the greatest improvements in class. The findings of this study suggest that when underperforming students were treated the same as the rest of the student body, their grades and achievement suffer, but when they are given choices and teachers tailor

instruction to their needs and learning profiles, the students begin to show more signs of engagement and their performance improves.

This study was an experiment that Eichert (1995) conducted in a school classroom of an unidentified number of students. She examined the performance of students determined to be underachieving based on inconsistencies in their work. Her initial question was “what are the effects of implementing a program of differentiated instruction in order to help underachieving students?”. To this end, she used the help of the teachers and administrators in a school to search out answers. She used detailed to show the findings from her research. Scores and rates of improvement were used to document the students’ progress. The study is quantitative and the information that was included is generalizable in other practices because of the detail of the data that was used to show students’ performance. The research shows objectivity as it presents the findings of the research.

This study is relevant to the investigation of my research question. The study was quantitative in the sense that numbers and rates were included in the findings. Because of this, the findings can be generalized and the methods can be assumed to be useful in other class settings. My question has to do with finding the best ways to differentiate instruction for underperforming students and this study suggests that implementing a differentiated program for these students can improve their performance. In this case, the researcher gave the students differentiated activities to work on that fit their learning styles and profiles. The class that was focused on was a music class and the students were given different ways to warm up and different ways to practice scales with their classmates. Although the study was not clear as to how these differentiated activities were chosen, it seems that when the control groups were given the differentiated instruction, it worked for them because they felt that they were challenged and that the teacher cared enough for them to personalize their instruction. The students reported higher levels of validation. The results suggested that when the activities are more appropriate for each student, the student learned more and performs better on assessments. This is a practice that is useful in various class settings and it pertains to my research question. This study shed light on the differentiation idea and gave insight on what strategies best meet the needs of underperforming students.

Since the study conducted was quantitative and the findings are demonstrated in numbers that show students’ progress, the findings are useful and can be easily analyzed. The sample size is small and narrow, however, meaning that the findings cannot be generalized. Since the study was conducted in a school setting, the possibility of using the results in other practices is strong. The study helped to answer my question because it focused on underperforming students and gave strategies for meeting their needs. Since many variables concerning the students (such as history, maturity, and extracurricular activities) are not considered, the internal validity of the study is partially in question. The study was an experiment and did not include enough personal factors about the students to give a complete picture. I think that the small size and narrow scope of the study is its most limiting factor.

There are various conclusions that I can draw from this study. Since it has been conducted in a thorough and quantitative approach, the findings clearly document the effectiveness of differentiating instruction for underperforming students. However, since the research was only conducted in one school and there are many unknowns about the students’ lives and study habits, the study’s effectiveness in answering my research question is limited. The fact that the research is quantitative but is only conducted in one school and dismisses many factors that could influence the findings greatly affects its effectiveness in answering my research question. I feel that this study influences how I think about my research question, but further research needs to be conducted in order to fully answer the question. In order to answer my question more completely, I will need to find studies that are more comprehensive, examining

multiple school settings and taking into consideration many aspects of the students' lives that will influence the findings.

**Critical analysis 2.** Martin and Pickett (2013) conducted a study that also sought to investigate questions around motivating underperforming students. The purpose of the study was to examine the effectiveness of a differentiation curriculum in a regular classroom setting. The researchers wanted to find out if a differentiated curriculum was an effective way of motivating students. The researchers' purpose was to give teachers tools to use in their classrooms. Since all teachers have experience with unmotivated and underperforming students, the researchers desired to provide answers for questions pertaining effective ways to motivate students.

The study revealed that when teachers differentiate their instruction based on flexible grouping and student choice, students who have been identified as underperforming are much more likely to engage in class activities and perform better on assessments. Specifically, when students were given choices in what kinds of assignments they would complete in order to show their understandings, they produced more work and it showed more effort. According to statements made in surveys, many previously unmotivated students felt appropriately challenged, validated, and motivated as a result of the instruction that was differentiated for their benefit. The study produced statistical data that also showed improved performance on assessments of content area skills and writing convention.

This study was an experiment in which the researcher conducted assessments before and after a differentiated curriculum was introduced to a group of students and conducted surveys among students in various classes. Certain students were identified as underachieving because of their history of hyperactivity, lack of attention, and inconsistent assessment results. The researcher examined two classes within one school and sampled 25 students in each. Some of the students who had been identified as underachieving were given a treatment of a differentiated curriculum that included alternative activities, flexible grouping, and choices in activities and products. Some of the underachieving students were allowed to participate in normal class activities and were not given the differentiated curriculum. This experiment yielded statistical data that shows the students' different levels of progress and improvement after the treatment had been administered. The students who had been given a differentiated form of instruction showed higher grades in classwork, on assessments, and also reported higher levels of interest and validation in surveys. The previously underperforming students showed higher levels of success.

This study was relevant to my research question because it pertained to differentiation for the purposes of improving the performance of underachieving students. The study examined the effects of differentiated instruction and compared this effect with the performance of students who were not given differentiated instruction. The study was also conducted in regular classroom settings, which is what I wanted to be included in the research I investigated.

Since the study conducted was quantitative and the findings are demonstrated in numbers that show students' progress, the methods are useful in answering my question. The findings cannot be generalized, however, because the sample size was too small and narrow. Since the results of the study include a comparison between students who were administered an alternative curriculum as a treatment and students who were not given a treatment, a strong visual emerges for how effective differentiation is for underachieving students. The study helped to answer my question about effective strategies for underperforming students. Again, many variables concerning the students backgrounds are not considered, so the validity of the study cannot be determined. Additional factors would increase the validity of the study. Furthermore, had the students been sampled across various settings throughout the

country rather than just pulled from one school, it would have been more effective in making claims about differentiation.

Since the study that Martin and Pickett (2013) conducted was quantitative and the findings of the study were detailed and included comparisons between students who were and were not given the treatment in the experiment, the methods are useful in answering my research question. Since the sample size was so small and narrow, however, the findings cannot be generalized. Additionally, the researcher compared the group that got the treatment to the group that did not, so readers could clearly see the effectiveness of the differentiation. The author's objectivity added to the effectiveness of the research. However, since the research was conducted in only one school, it was limited in scope and although it was helpful in providing some answers to my question, its' effectiveness in answering my research question is somewhat limited. In order to answer my research question completely, I will need to research more and find studies that are more comprehensive and include research across different types of classes, ages, and demographics.

**Critical analysis 3.** Servilio (2009) conducted a study to determine the effects of differentiated instruction. The researcher's primary focus was on motivating students to read through differentiated instruction. Since students' motivation levels tend to fluctuate depending on what interests them, the researcher found it important to analyze the effects of a differentiated program in order to improve their performance. This researcher wanted to see the effects on the students when a joint effort was made with the special education teacher in the school. Together they would seek the best ways to motivate the underachieving students in the classroom.

The researcher, along with the special education teacher and the regular classroom teacher, found that when a differentiated approach is taken towards students' reading, the students were much more likely to engage in the reading, comprehend what they read, and perform better on assessments. The findings of the research were recorded as numbers as well as descriptions of changes in classrooms. This shows that the researcher used mixed methods of research, including elements of both quantitative and qualitative research. In particular, Servilio (2009) found that students benefited most from having a choice in what to read and were coached individually on how they should engage in the reading. The students reported a higher level of engagement and enjoyment of reading.

This study was an experiment that was conducted in one classroom of an unidentified number of students to see what effects differentiation has on students' reading performance. The researcher teamed up with a regular classroom teacher and a special education teacher and began assessing students' reading performance. The team identified students that could be considered underperforming based on their behaviors in class and their inconsistency on assessments. The team then began to treat these students with a differentiated approach. They allowed the students to choose what they read and coached them carefully on how engage the text. They even allowed the students to produce what they wanted to show their understanding and comprehension of the text they read, while they let the rest of the class carry on regular classroom activities in reading. The sample included 24 students, 6 of which had learning disabilities and the school was considered to be in a low income area of the United States. As a team, the researchers and teachers engaged this experiment. They engaged in peer review, triangulation, and member checking as they utilized multiple research resources and methods. These professional practices are important and increase the credibility of the study. These practices also effect whether the readers can take the findings at face value, since they went to great efforts to ensure the findings were legitimate.

This research study is relevant to my research question and the research team worked hard to engage in professional practices that validate the study, but it would be more useful if it considered more

factors that influence the research. The study does pertain to differentiation and motivating students, so it answers my research question to some extent. I am interested in motivating students to read with a high level of engagement and this study responded to that interest. The ways in which the researchers engaged in the research (peer review, triangulation, and member checking) help strengthen the validity of the findings. The other part of this study that helps inform my research question is the points at which the researcher assess the students' progress throughout a learning segment. This allows for definitive answers to questions regarding the effectiveness of differentiated instruction.

This study was quantitative and qualitative, and the findings are demonstrated with some numbers and some descriptions that show students' progress. The methods are helpful in answering my question, but again the sample size is small and the scope is narrow, so the findings are not generalizable. Since the results of the study include a comparison between students who were administered an alternative curriculum as a treatment and students who were not given a treatment, a strong visual emerges for how effective differentiation is for underachieving students. The research team also engaged in effective research methods that strengthen the argument that differentiated instruction is effective for improving students' reading. It would also have been made more valid if the researchers had included information about the students and their backgrounds. This study did, however, define effective strategies for differentiating for students who need access and motivation.

It is apparent that this study is effective in answering the question of whether differentiated instruction is effective for improving students' reading. Even though the study was objective in stating the facts around the students' achievements and the research team was responsible to engage in practices such as peer review and member checking, it cannot be entirely effective in answering my research question since it focuses on reading and samples only one school setting. As I continue to investigate my research question, it will be important for me to find research with wider coverage and a high level of attention to various factors, such as age, history, and maturity level of the sample as well as other variables.

**Critical analysis 4.** Reeves and Stanford (2009) conducted a case study that tracked the progress of one student through a differentiated instruction routine that was designed to improve her performance and motivation in her class. The researchers found student motivation to be a matter of high importance because it gives students their own personal reason to engage in the learning. They chose to analyze one student. This practice allowed them to focus their findings and limit the number of variables that could influence their ability to draw conclusions.

A student was chosen for this treatment based on her low attention level in class and her interest in class activities. The researchers found that this student, when given a differentiated form of instruction, began to perform at higher levels. Through detailed descriptions of changes in the student's attitude and level of engagement, the research shows how the differentiated instruction helped the student. The researchers pointed to her increased level of participation and described her progress and increased success on assessments. The student reported higher levels of engagement and said she felt the teachers cared about her performance more.

This was a case study that highlighted the progress of one student throughout the process of a differentiated program. The researchers started with a question about how effective differentiated instruction was. They decided to choose just one student to analyze, because this limits the number of variables that can influence the ability to make conclusions. To choose which student to examine, the researchers worked with classroom teachers and identified a student who was thought to be underachieving. This particular student was observed as an experiment was conducted. The researchers watched closely as the students' teachers tailored her instruction to meet her learning profile and needs.

She was given choices in what to read, what types of activities to perform in class, and the teachers developed new ways to challenge her by retrofitting the curriculum she interacted with.

This study is very relevant to my research question and serves to get me a step closer to the answer to my question. This study is relevant because it shows the findings of an experiment conducted on an underachieving student. The study portrays a student in a regular classroom who is struggling to stay motivated and engaged. The work that the researchers do to experiment with differentiated instruction shows a lot about its effectiveness. Since this study describes the progress that the student makes when differentiated instruction is implemented, I can see how effective it is. My question has to do with finding effective ways to differentiate instruction and since this study describes ways in which the differentiation worked for an underachieving student, it seems relevant and since the research conducted is qualitative, it is transferable to other practices as well.

Since this study conducted was qualitative, the findings are demonstrated with some descriptions that show students' progress, this provides me with important insights into the types of changes that the student experienced as a result of differentiation. The study includes an analysis of a students' progress as a result of differentiation, so I can now more effectively determine the effects of differentiating instruction for underachieving students. The study gives effective strategies for motivating students. It would have been helpful to know more about the student's life and background. Also, knowing how long the researchers followed her progress would have made the case study more valid.

This study has been helpful in informing the answer to my research question. Since the scope of the research was limited and the researchers did not consider some variables, a limited number of conclusions could be drawn. We know that given the descriptions of the student's progress as a result of differentiated instruction, it is apparent that differentiation positively affects underachieving students' performance. The findings of the study were presented as descriptions and statements of the student's achievements. This is helpful in determining the answer to my research question, but I feel that statistical data of the student's progress would be a more credible way of solidifying the claim that differentiation works to motivate students and improve their performance. It is difficult to confirm that the research would be useful in answering my question and useful in other classes. The research was also limited in answering my question in the sense that it did not include information about the student (such as facts about the student's home life, educational background, and development in maturity). It is therefore difficult to draw conclusions about the effectiveness of the strategy since there are still unknowns about the student.

**Critical analysis 5.** Rubenstein (2012) conducted a study for the purpose of examining the effects of differentiating instruction for what is referred to as gifted students. Rubenstein set out to address an important question about the effectiveness of differentiation. When students are identified as gifted, they are often also considered underperforming. This is because the students are not given access to the material, but are rather told they are unable to meet the set standards because it doesn't match their mode of learning. Teachers and researchers look for ways to improve their performance and motivate them to learn, but often do not use strategies to give them access. This study is another attempt to show the effectiveness of differentiating instruction.

The findings of the study revealed that the differentiated instruction that was tried on certain students proved to be helpful in improving their performance. The intervention students' grades were slightly higher than the other students and appeared to be more likely to engage in school activity. The researchers found multiple possible reasons for the grades improvement. Out of the 5 strategies used on the students, some showed much more effectiveness than others. The researchers wanted to motivate

students who were underachieving. Students who have the ability to do well in school but do not are the best candidates for this intervention. The study is qualitative in nature and the findings, which are presented as statistical data, are generalizable.

The researchers conducted two studies to determine the effectiveness of a new model for improving student achievement and motivation. The design appears to be an experiment, since the researchers observed the students, then applied a treatment and conducted interviews and surveys, and then observed the findings. The researchers seem to be writing from a post-positivist paradigm. The study is quantitative because it presents rather detailed findings with numbers and rates attached. The researchers, which included Rubenstein as well as classroom teachers from various areas, engaged in peer review and member checking as they progressed through the experiment. The researchers sampled underachieving students (based on grades) throughout 19 school districts. Teachers from 21 different school districts in 19 states participated. The students' grades in either mathematics or reading/language arts were recorded at the beginning and end of the 6- to 9-week intervention period. Weekly, the teachers completed a self-report of strategy use form, on which they indicated which strategies they had used during the week.

The study was relevant to my research question because it pertained directly to the question and gave statistical data to strengthen the evidence within the study. My question has to do with finding ways to motivate students through differentiated instruction. Since this study examines the performance of a group of students who have been determined to be gifted (yet underachieving) and gives detailed findings of how the experiment worked, it proved to be relevant and useful in answering my research question. The interventions that the researchers used are useful and helpful in answering my question.

Since the study conducted was quantitative and the findings are demonstrated in numbers that show students' progress, the methods are useful for answering my questions. Since the study includes an analysis of a large group of students over a large area, the argument that differentiation is helpful in motivating underachieving students is strengthened and the findings are analyzed at a scope in which they can be generalized to other school settings. Additionally, since underachieving students were pulled at random from many different school districts, the findings are more valid than if they had been chosen out of convenience or proximity. Although many students are sampled, no information about their backgrounds are included, so there are factors that could have skewed the findings.

This study was relevant and helped me conclude that when teachers use differentiated instruction, the students are more likely to succeed. This study was quantitative and the findings were presented in sets of numbers that illustrate students' progress, so I can see the areas where differentiation helped the students. Because of the nature of the study, the findings are generalizable to readers. The researcher presented the findings in an objective way and did not show any bias in authoring the study. This study also examines a large student population, which increased its effectiveness in answering my research question. I am getting closer to answering my research question and the strength of this study helped to inform my answer to a great extent.

**Conclusion.** My research question has to do with how differentiation can work to motivate underachieving students. The research that I have reviewed shows that students from various class settings benefit from differentiated instruction. I also found through reviewing these studies that students who are underachieving are able to engage in classroom activities more when the instruction is varied and differentiated according to their learning needs and profiles.

I have discovered useful teaching strategies for my future as an educator through the reviews of the research that I have conducted. The studies I reviewed showed that differentiated instruction is helpful

for underachieving students and the research has shown that it helps all the students it is used on to some degree. The findings within the studies all reveal the usefulness of differentiated instruction. I will use these findings in future lessons as a teacher. Furthermore, I have learned from this research that giving students' choices in their learning as a way of differentiating proved successful in every attempt. Some important patterns emerged in the studies. The researchers were all interested in the effects of differentiated instruction, but they all conducted studies that were narrow in scope and sampled a small number of students. The important thing, however, was that they all showed, in one way or another, that differentiated instruction helps give students access to the class' learning content. I will proceed to investigate further into research around differentiating, since the research I reviewed had certain limitations. For example, none of the studies that I reviewed included demographical information about the students that were sampled. I plan to continue to search for articles on my journey towards being skilled in differentiation. I would like to know who and what benefits the most from different kinds of differentiation. Since the research I discovered was informative but limited in scope, I plan to find more comprehensive studies. I feel that I now have a better understanding of my question as a result of my research. I am now more certain that differentiation is effective, because all the research I reviewed indicated so. I have also walked away with some strategies that seem to be effective in motivating students. I will use these findings in my teaching as I also continue to do research on the topic. I also plan to conduct some of my own research on differentiation and conduct experiments of my own with my students. I feel that nothing will be more useful than research that I conduct in my own classroom!

## **Conclusions and Key Insights**

The overall purpose of our group's research question was to explore ways to create access to content and curriculum for ELL students. Additionally, a subsection of our studies focused on engaging the unengaged student. Our hope was that through both investigations we would be able to find some tested strategies that created access points in learning for both of these kinds of students. During our investigations we constructed three questions to guide our thinking for each of our individual parts of this paper. The first question was in "how can we differentiate curriculum in a way that improves student's reading comprehension?", the second questions was "what kind of differentiated instruction can educators provide regarding academic vocabulary, that will help improve language minority students on writing assessments?", and our last question was "in what ways can educators scaffold curriculum to motivate unmotivated students".

The first two-sections deal with scaffolding strategies related to differential instruction for English language learners and language minority students. An important strategy that became apparent in various research studies was creating curriculum that has a personal connection with the students ( Echevarria, Richards-Tutor, Canges, and Francis, 2011). Large numbers of students from different countries appear to find it difficult to study the history and the culture of places that are unfamiliar to them. These insights led us to believe that by creating assignments that connect to student's background knowledge may show that as an educator, you value who the students are and above all it may lead to a student's investment in the curriculum. As a result this seems to have a direct effect on a student's ability to understand the importance of a lesson and in turn motivates students because they care about the assignment (Salinas, 2008 ). Additionally, another resource that may help students struggling with language acquisition of a new language is providing a pop up electronic dictionary ( Fry, 2007).This

appears to be an easy way to make language more accessible to students without having to bring in a translator or interventionist. Furthermore, finding ways to embed vocabulary by creating an emphasis on vocabulary instruction, the use of brief videos, purposeful discussion to build concepts, the use of graphic organizers and other writing activities to build comprehension or vocabulary through writing, and structured pair grouping seems important to a student's comprehension of academic language and new concepts (Vaughn, Martinez, Reutebuch, Carlson, Thompson, & Franci, 2010) .

Moreover, another thing that we inferred from our review of research was the importance of assessing a student's first language skills in order to adapt curriculum to meet a student's needs (Palmer, El-Ashry, Leclere, & Chang, 2007). First off, a student's ability to write and read in their first language appears to directly affect their ability to read and write in English. By knowing a student's language background perhaps educators can begin to scaffold curriculum that gives language minorities access to academic language by looking for commonalities in morphology, phonology, and semantics between the two languages ( Kieffer & Box, 2013). For example, morphemes such as affixes and roots are key components of understanding academic vocabulary because academic vocabulary usually has these key signifiers that relate meaning. Lastly, one can infer that morphological awareness seems to relate to reading comprehension and ability to perform well on writing assessments. By scaffolding curriculum that creates access points to academic vocabulary, students may begin to learn to think and speak like experts in their individual content areas (Zwiers, 2006).

The last section of this paper deals with differentiating curriculum in order to motivate the unmotivated student. What we found is that it is imperative for educators to first learn their students' needs if we are expected to motivate them. This means doing individual evaluation of students learning styles, so as an educator you can create curriculum that has been adapted to meet their needs (Martin & Pickett, 2013). For example, if large numbers of students are visual learners you may need to create curriculum that includes pictures and video. Also, another important tactic of motivation students is providing choice (Eichert, 1995). Students who have freedom in choosing their learning activities or topics of interests have been shown to be more motivated to engage in classroom activities. Lastly, flexible groupings are important in order to motivate students (1995). Giving students opportunities to choose the people they want to collaborate with or to choose groups according to particular interest is integral in motivating the unmotivated. The studies we reviewed have showed that differentiated instruction gives students ways to access the material, which increases the likelihood they will engage and succeed.

From this review of literature, we have collectively come to realize that differentiating curriculum and instruction does not only benefit students struggling with learning a new language but even English only students as well (Vaughn, Martinez, Reutebuch, Carlson, Thompson, & Franci (2010). The researchers intervention increased test scores not only in regards to the ELL populations but also English only students as well when compared to the control group of the same students ( 2010). Additionally, it seems imperative to assess a student's first language ability in order to understand the misconceptions and language gaps that students possess (Palmer, El-Ashry, Leclere, & Chang, 2007). Once this is done you may have the tools to adapt curriculum to meet that student's needs. As three new teachers heading into our first year of teaching, we now plan to find ways to understand a student's language background in relation to their morphological awareness of words, because it seems important in helping ELL students make connections between their own language and their new language ( Kieffer & Box, 2013. Also, as three new teachers we plan to find ways to embed academic vocabulary into everyday classroom activities, because it seems the more students have chances to experiment with academic vocabulary, in

the settings they are intended for, the more likely these students will create meaning from these words (Snow, Lawrence, and White, 2010). Lastly, we now plan to add flexibility of choice into classroom lessons plans (Eischer, 1995). Giving students choices may allow unmotivated students to feel in control of their own learning and also lets them pick activities that are of interest to them, which in turn hopefully will motivate them.

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