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Activating Prior Knowledge With Cues and Questions As a Key Instructional Strategy to Increase Student Achievement in Low Socioeconomic Middle Schools

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2011

Abstract

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by

Michael Glenn Cason

Master of Music, Northwestern University, 1985

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Doctoral Study Submitted in Partial Fulfillment

of the Requirements for the Degree of

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Abstract

The No Child Left Behind (NCLB) Act created new accountability for educational institutions where schools must demonstrate adequate yearly progress (AYP) by regularly increasing student achievement. Many school districts across the nation failed AYP, searched for effective teaching strategies, and used new instructional models to help, yet they continued to fail. Thousands of educational institutions turned to the learning-focused schools (LFS) model of instruction, but increases in student achievement were sporadic. The rationale for this project stemmed from inconsistent student achievement results at a local middle school while using LFS from the inception of NCLB. This project study reviewed the teaching strategy of activating students' prior knowledge at a low-socioeconomic status (SES) middle school. Theoretical foundations guiding this study included learning theory, constructivist learning, the effects of low-SES environments, instructional strategies, and the role of prior knowledge in learning. Using archival data, this ex post facto study found a statistically significant difference using an ANCOVA, $F(1, 863) = 35.398$, $p < .000$, for the research question investigating the effect on student achievement when teachers specifically activate students' prior knowledge before using the LFS model of instruction. The project is an instructional lesson plan design that activates students' prior knowledge; recommendations include implementing the project countywide. Positive social change implications include providing policy makers data on the effectiveness of activating students' prior knowledge, the long-term effectiveness of LFS, and recommendations for increasing student achievement consistently.

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Dedication

This doctoral study is dedicated to my mom and dad, Ann and Bob Cason. My parents have always guided and supported my many endeavors throughout my life. With their constant love and support, they encouraged me to give my best always.

My dad holds high regard the values of honesty, consistency, integrity, family, generosity, stewardship, community, and a strong work ethic. Lasting images are of my dad are at the table as he stops before each meal and prays to God, asking a blessing for the food. My dad has cast an endearing legacy and light over his family, community, and countless people. My dad is the bedrock of our family.

My mom shows me what a life-long learner looks like. During her 30s, mom focused on training up children in the way that they should go (Pr 22:6, NIV). At 40, she took tennis lessons and participated in singles and doubles matches for years. Mom joined Weight Watchers at 50 and completely transformed her cooking and eating habits (ours as well) from good ol' Southern cookin' to health-minded cuisine. At age 60, mom began reading voraciously, joined the YMCA, and began exercising regularly to tone and build muscle. At age 65, mom began working the daily crossword puzzles from the state newspaper; after some months, she worked them in ink. At age 70, mom bought her very first computer; she used it to write Sunday School lessons and send/receive e-mail. Shortly thereafter, mom compiled a Word document to track her 2,000+ books she had read over the past few years. Her single spaced "Book book" is well over 100 pages at last count. By the time she was 76, her knowledge of computers allowed her to help teach computer classes to the "old people" at church. Simultaneously, she regularly volunteered at the local hospice store to raise funds for terminally ill patients.

Acknowledgements

I acknowledge that in the spring of 1980, "…when the kindness and love of God our Savior appeared, he saved [me] not because of righteous things [I] had done, but because of his mercy. He saved [me] through the washing of rebirth and renewal by the Holy Spirit, whom he poured out on [me] generously through Jesus Christ our Savior, so that having been justified by his grace, [I] might become heirs having the hope of eternal life. This is a trustworthy saying. And I want you to stress these things, so that those who have trusted in God may be careful to devote themselves to doing what is good. These things are excellent and profitable for everyone." (Tit 3:4-8) I thank you God the Father for calling me, Jesus the Son for saving me, and the Holy Spirit for sealing me.

I acknowledge that I would not have started, continued, or finished this program without the unswerving support from my wife, Etta, a true helpmate. As it is written, "A wife of noble character who can find? She is worth far more than rubies. Her husband has full confidence in her and lacks nothing of value. She brings him good, not harm, all the days of her life…. Many women do noble things, but you surpass them all…a woman who fears the Lord is to be praised." (Pr 31: 10-12, 30, NIV)

I acknowledge the strong support and guidance at the local middle school, in particular, Mr. Craig Wilcox, principal, Mr. Blake Keown, assistant principal, Mrs. Tammy Skelton, Dr. Laura Leigh Rambach, county reading interventionist, Mrs. DeAnne Peck, choral and general music teacher, and the participating teachers in this study.

I would be remiss if I did not acknowledge the support from Myralynn Catchings, the amazing Walden Library Support team, the incredible faculty and staff behind the scenes, the excellent Student Support team, and the wonderful teachers at Walden

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Table of Contents

List of Tables

List of Figures

Section 1: The Problem

The learning process is both interactive and complex. Students bring to the classroom unique personal histories with different cultural backgrounds, home situations, socioeconomic status, and prior learning. A student's personal history has a significant impact on their learning in school (Marzano, Gaddy, & Dean, 2000b); prior knowledge filters a student's new learning (American Psychological Association, 2008; Bransford, Sherwood, Vye, & Rieser, 1986; Schwartz & Bransford, 1998; Spires & Donley, 1998; R. A. Thompson & Zamboanga, 2004; Wilson, Peterson, & National Education Association, 2006). A student's individual experiences and knowledge shape their understanding; during an instructional lesson, teachers direct and facilitate activities to help students expand those understandings. One way a teacher can incorporate a student's previous academic achievement and unique, personal histories is by activating their prior knowledge before presenting the main learning goal. To maximize classroom effectiveness, teachers need to know students' prior knowledge, engage that prior knowledge, and help students construct new learning on and around that prior knowledge (Bransford, Brown, & Cocking, 2000; Gagné, 1980; Guarch, 2003).

When teachers explicitly promote an environment where students' new learning is based on prior knowledge, teachers create a constructivist-learning environment (Hawley & Rollie, 2007; Straits & Wilke, 2007). Constructivism is the learning theory which states that students actively engage in creating new meaning from what they already know (Abdal-Haqq, 1998; Donovan, Bransford, & Committee on How People Learn, 2005a; Hung, Tan, & Koh, 2006; McInerney, 2005; A. Miller, 2004; Semple, 2000;

Vosniadou, 2007). Teachers may use different instructional methods in a constructivist setting, but no matter which instructional method teachers use, effective student learning begins with activating a student's prior knowledge (Gagné, 1980). Problem-based learning, computer-based learning, differentiated instruction, discovery learning, direct instruction, brain-based learning, guided instruction, collaborative grouping, and lecture are all methods whereby students can learn, but effective learning always begins by linking new content to a student's prior knowledge (Marzano, 1998). Activating a student's prior knowledge is the first step for learning no matter which instructional method is used (Payne, 2008).

The local school district began implementing the learning-focused schools (LFS) model of instruction in the 2002/2003 school year with the expectation that LFS would consistently increase student achievement (Y. H., personal communication, March 25, 2010; T. S., personal communication, March 8, 2010). The model's creator, Thompson (2009k), indicated that LFS was a "comprehensive school improvement model…that [was] organized into a framework designed explicitly for raising student achievement" (para. 3), and that LFS "works for all students, including and especially for at-risk [for failing] students" (2009e, para. 17). LFS promoted this model of instruction as effective in increasing student achievement in schools similar to the ones in the local county. LFS materials indicated that there would be rapid and substantial gains in student achievement, in the order of double-digit percentages—per year—when using their model of instruction, as well as long-term retention of material (M. Thompson, 2009a, 2009c, 2009e, 2009g, 2009k). Researchers suggested that large-scale, reform-oriented

instructional changes, even used over an extended period, might not produce the increase in student achievement as desired (Le, Lockwood, Stecher, Hamilton, & Martinez, 2009). Contrary to the LFS promotional material and in agreement with what Le et al. have found, the local school district has not seen the double-digit increases per year in student achievement, and some areas of student achievement have significantly decreased in the past 8 years. Other school districts have experienced similar results (Royer, 2009).

Overview

Curriculum coverage is not synonymous with learning (Myhill & Brackley, 2004, p. 270). The intent of this project study was to draw out research-based instructional practices and findings that indicate effective means of teaching middle school students of low-SES. The focus was on activating students' prior knowledge before using the LFS model of instruction to present the main learning goal. Specific to this study, as suggested by several gaps in the literature, was a single, specific instructional strategy, cues and questions, to activate prior knowledge. This study:

- reviews the importance of a student's prior knowledge,
- reviews the effect of low-SES situations on student achievement,
- highlights effective means of teaching low-SES, middle school students,
- reviews educational reform methods, and
- outlines the LFS model of instruction (Riedl, 2009; M. Thompson & Thomason, 2002).

The Problem

A problem exists in the Georgia public educational system for teachers who teach students in low-SES middle schools. That problem, specifically, is that teachers in low-SES middle schools are likely to teach students with less prior knowledge (Marzano, 2003; Sirin, 2005; Wyner, Bridgeland, & Dilulio, 2008), and teachers in low-SES middle schools need to use the most effective instructional strategies to consistently increase the academic success of their students ("Characteristics of the world's high-performing school systems," 2008). However, teachers may be uncertain that there are specific strategies that are effective, which instructional strategies are the most effective, or how to prepare for class adequately (Schleicher, 2009). The local school system required that teachers use the LFS standardized instructional format for lesson design and presentation. Even with a standardized lesson plan, some middle schools in low-SES situations in the local county continued to perform below local, state, and national expectations on standardized tests. This problem could impact Georgia in the future because students from low-SES middle schools may not be fully prepared to contribute as adult citizens (Plucker, Burroughs, & Song, 2010; Weissbourd, 2009). Many possible factors may contribute to this problem, among which are the principle for the construction of knowledge (American Psychological Association, 2008), teacher instructional strategies (Z. Barley et al., 2002; Marzano, 1998), prior or preexisting knowledge (Donovan, Bransford, Pellegrino, & National Academy of Sciences-National Research Council, 1999), instructional techniques to activate students' prior knowledge (Gaddy, Dean, & Kendall, 2002; Kearsley, 2009; Kruse, 2010; Pacchiano, 2000), effects of linking prior

knowledge in low-SES students (Gaddy et al., 2002), use of cues and questions (Marzano, 1998; Reinhart, 2000), variables of the teacher-level effect (Marzano, 2000), effects of low-SES situations (Sirin, 2005; Stewart, 2008; Wyner, Bridgeland, & Dilulio, 2008), and teacher effectiveness (Bransford et al., 1986; Garrison, 2004; Marzano, 2000). This study will contribute to the body of knowledge needed to address this problem by determining if the teaching strategy of activating students' prior knowledge with cues and questions before using LFS affects the achievement of students in low-SES middle schools.

Evidence of the Problem at the Local Level

AYP. There are just over 1,600,000 students in Georgia in approximately 2,220 schools, and almost one half of the schools are Title I schools (Center on Education Policy, 2009a; Georgia Department of Education, 2009e, 2009g, 2009n, 2010b, 2010e; U.S. Department of Education, 2009c, 2009d). Georgia's "Title I schools have a significant population of economically-disadvantaged students" (Georgia Department of Education, 2009h). The data show that the local low-SES middle school, Tiger Middle School (pseudonym), is in a Title I school district and is required to increase student achievement as detailed by NCLB (Georgia Department of Education, 2008a; Local County School District, 2009a; U.S. Department of Education, 2009a). The national and state data show that in the 8 years AYP has been established, student achievement scores have been inconsistent, Tiger Middle School has passed AYP only twice, has been a needs improvement school, a needs improvement school level 2, and had come under

federal mandates and sanctions (Georgia Department of Education, 2003a, 2004b, 2005b, 2006b, 2007b, 2008c, 2009f, 2009i; U.S. Department of Education, 2008, 2009b).

For this study, long-term student achievement was measured by the Criterion-Referenced Competency Tests (CRCT) standardized tests that were used to determine annual AYP status. When NCLB was enacted, each state generated standards, determined the standardized tests, and identified the passing scores for student proficiency that define the state's AYP (Center on Education Policy, 2009a; Education Trust, 2003; Futrell & Gomez, 2008; Gaddy et al., 2002; Georgia Department of Education, 2008a, 2009k; Johnson, Peck, & Wise, 2007; Local County School District, 2009e). The National Center for Education Statistics developed a scale whereby a state's proficiency standards for student achievement could be compared to other states. For grade 8 reading and mathematics, Georgia had the next to the lowest scores for all states reporting (Bandeira de Mello, Blankenship, & McLaughlin, 2009, pp. 17, 20). The state data show that students were either not scoring consistently high enough on the CRCT or not attending school regularly enough for Tiger Middle School to pass AYP on a consistent basis (Georgia Department of Education, 2003a, 2004b, 2005b, 2006b, 2007b, 2008c). Figure 1 presents the mean reading and math CRCT scores for all students at Tiger Middle School from the 2002/2003 to 2009/2010 school years. The data began in the 2002/2003 school year as that was the first school year standardized test results provided data for NCLB (2003a, 2004b, 2005b, 2006b, 2007b, 2008c, 2009f, 2010a). According to the 2010 results for Georgia, 29% of all schools and approximately 21% of

the middle schools did not demonstrate adequate increases in student achievement (Center on Education Policy, 2011; Georgia Department of Education, 2010f).

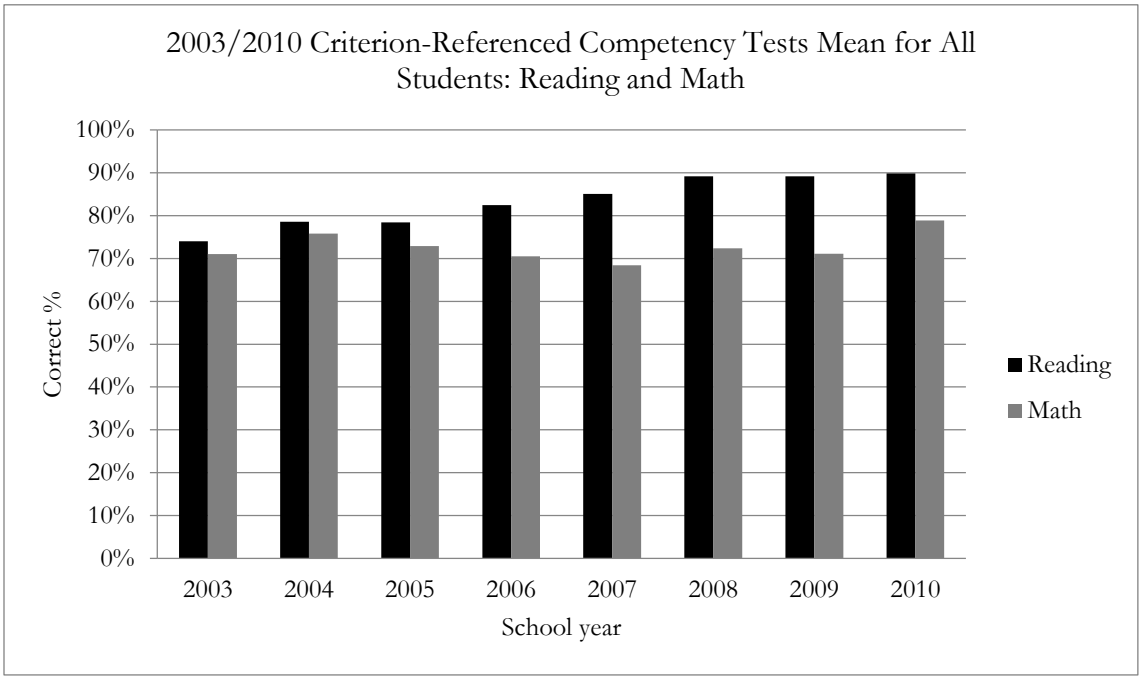


Figure 1. Mean of Criterion-Referenced Competency Tests Reading and Math Scores from 2003/2010 School Years

Standardized tests do not necessarily measure all aspects of a student's knowledge. Tests "are not perfect measures of student achievement" (Chudowsky, Chudowsky, & Kober, 2009, p. 4), are "incomplete and imperfect measures of student learning" (Center on Education Policy, 2009a, p. 9), and certainly do not measure all forms of intelligence (Sternberg, 2006). The form of the test questions may not accurately assess a student's knowledge (Le et al., 2009), and test questions may fail to detect certain thinking skills (Slavin, Lake, & Groff, 2009). Yet, the design of the diagnostic state's CRCT is to assess the skills and learning of the Georgia Performance Standards curriculum (Georgia Department of Education, 2009l, 2009o; Local County

School District, 2009b; Popham, 2009a). Currently, all gifted, regular education, and special education students are ranked according to the same standard, score, and benchmark (Mid-continent Research for Education and Learning, 2004). As Tiger Middle School is in a Title I school district in a state where the standards for demonstrating increased student achievement are among the lowest in the nation, teachers need to use the most effective teaching strategies to help their students learn the curriculum, demonstrate mastery of the content, and prepare their students to contribute to society.

Standardized test scores and Learning-Focused Schools (LFS). The local school district began implementation of the LFS model of instruction throughout the district (and in Tiger Middle School) in 2002/2003 by having the LFS organization provide the initial training for the school leadership. After the leadership was trained, training, implementation, and follow up sessions occurred during the 2002/2003 school year; the researcher was a part of the initial training in 2002/2003 and the follow up training in 2003/2004. Thomson's analysis (as cited in Royer, 2009) indicated that the largest gains in student achievement would occur "after the third year of implementation" (p. 114). Yet in 2008, after 6 years of the school district requiring all teachers implement the LFS strategies to increase student achievement, the school had not demonstrated consistent increases in student achievement as expected (Local County School District, 2009c, 2009d; M. Thompson, 2007; M. Thompson & Thomason, 2002).

Reviewing the underlying CRCT data for the sixth, seventh, and eighth-grade students showed that LFS has had little effect on the CRCT scores. Table 1 illustrates the

annual CRCT scores for sixth, seventh, and eighth-grade students who met or exceeded in reading and math for school years 2000/2001 through 2009/2010 (Georgia Department of Education, 2003c, 2003d, 2003e, 2006c, 2006d, 2006e, 2008f, 2008g, 2008h, 2009a, 2010a). The dividing line below the 2001/2002 data indicates the year Tiger Middle School implemented LFS, the same year NCLB required AYP. The data allowed for tracking reading and math scores by grade level. Tracking the sixth-grade class beginning in 2003 when LFS was first implemented, the reading scores went from 86 in 2003 to 80 in 2005—a change of -6 points in 3 years, and the math scores went from 76 to 63— a change of -13 points in 3 years. LFS, without specifically activating students' prior knowledge, had not produced the increases in student achievement as expected nor required by NCLB. Using the pre-LFS 2001/2002 CRCT scores as the benchmark for the effectiveness of LFS, the amount of change in scores (indicated by percentile points and percent change) from 2001/2002 to 2009/2010 is indicated below each subject column. The overall, school wide net effect in change in student achievement after using LFS for 8 years was a decrease of -4 points or -1%.

Table 1

Percentages of Students Who Meet or Exceed on the CRCT Reading or Math for School Years 2000/2001 Through 2009/2010

	6th Grade		7th Grade		8th Grade		Net change
School Year	Reading	Math	Reading	Math	Reading	Math	
2000/2001[a]	74	77			87	60	
2001/2002	82	70	91	78	87	71	
2002[a]/2003[b]	86	76			80	66	
2003/2004	75	74	88	79	81	71	
2004/2005	80	74	85	77	80	63	
2005/2006	85	57	73	73	89	74	
2006/2007	85	55	84	77	85	70	
2007/2008	92	57	88	77	94	78	
2008/2009	86	61	88	78	98	95	
2009/2010	90	70	85	82	70	78	
2002/2010 Change	8	0	-6	4	-17	7	-4
LFS % Change	10%	0%	-7%	5%	-20%	10%	-1%

Note. [a]Tiger Middle School implemented LFS. [b]Test not given in reading or math for seventh-grade students.

As the student population in the county has grown from 21,623 in 2004 to 27,781 in 2009 to 28,356 in 2010 (Georgia Department of Education, 2005c, 2009m; Local County School District, 2010b), more schools have been built to equalize school size. Tiger Middle School enrolled 1,004 students, 44% of whom were economically disadvantaged, in 2004, and in 2009/2010, Tiger Middle School enrolled 682 students, 62% of whom were economically disadvantaged (Georgia Department of Education, 2005d, 2010c). The students attending Tiger Middle School are in low-SES environments and need to demonstrate increases in their achievement, but the problem extends past the local area.

Evidence of the Problem in the Larger Educational Context

According to Herman et al. (2008b), thousands of schools across the nation are failing to show adequate increases in student achievement on standardized tests as indicated by AYP status. Hundreds of thousands of students are in schools considered in need of improvement by NCLB. As there are consequences for a school not demonstrating annual increased student achievement, low-SES schools in particular may increase pressure on teachers, reduce curriculum coverage, regularly practice test-taking strategies, or otherwise convey to students that the primary goal of learning is to pass a test (Nichols & Berliner, 2008).

Implications of AYP. As a part of NCLB, schools must demonstrate that students annually increase achievement on standardized tests that determine AYP status for that school year. There are no federal sanctions or consequences to a school for not making AYP the first year (Georgia Department of Education, 2009k). A school that has

not met AYP for 2 consecutive years is labeled *needs improvement*, must create a 2-year improvement plan, and must offer students school choice to other schools in the same district. If a school does not meet AYP for 3 consecutive years, the same sanctions continue with the addition that the school must offer free tutoring or additional academic help. If a school does not meet AYP for 4 consecutive years, the previous sanctions remain with the addition that the district must implement corrective action that could include replacing selected staff members or introduce new curriculum. For schools that do not meet AYP for 5 consecutive years, the previous sanctions remain with the addition of responsibilities of the school district to restructure the school by removing most or all of the staff, or turning the school over to private or state officials (U.S. Department of Education, 2008, 2009a, 2009b).

Of the 88,358 schools nationwide in school year 2006/2007, 30% of the schools (34,359) did not demonstrate adequate increases in student achievement, 11% of the schools were labeled needs improvement, and 2% were in need of restructuring (Herman et al., 2008b; National Center for Education Statistics, 2009a). Herman et al. (2008) wrote that there is a strong need to, "quickly improve student achievement…for low-performing schools that serve disadvantaged students" (p. 4). Herman et al. also noted that a chronically low-performing school is one where 20% or more of the students are failing the NCLB mandate for 2 or more years. There are chronically low-performing schools in northwest Georgia.

There is an increase in Georgia of students not demonstrating increased student achievement as indicated by AYP. In Georgia, 374 schools did not pass AYP in 2007

and 503 schools did not pass AYP in 2010, an increase of approximately 34% (Georgia Department of Education, 2007c, 2010j). Of the 2,100 schools in Georgia in 2006/2007, 315 were in need of improvement (National Center for Education Statistics, 2009a). According to the Georgia Department of Education (2010f), at the end of the 2009/2010 school year, of the 2,221 schools in the state, there were 278 schools in the needs improvement, school choice, supplemental educational services, corrective action, or state directed categories:

- 63 at NI-2 (school choice),
- 51 at NI-3 (corrective action),
- 34 at NI-4 (corrective action), and
- 130 at NI-5 or greater (state directed).

There have been general trends of improvement in Georgia for all sixth, seventh, and eighth-grade students' CRCT reading and math scores from 2007 to 2010 (Georgia Department of Education, 2008d, pp. 3-4; 2009o, pp. 6-8; 2010g, pp. 7-9, 19-23). As the requirement increases every year for schools to improve standardized test scores for all students, these trends in increased student achievement have not been enough to decrease the number of schools failing AYP. In 2009, of the 2,172 schools in the state, 305 schools (14.0%) did not pass AYP; in 2010, of the 2,221 schools in the state, 503 (22.6%) schools did not pass AYP; and reports in 2011 indicated 29% of Georgia schools did not show adequate increased student achievement—and increase of 15 percentile points in 2 years (Center on Education Policy, 2011; Georgia Department of Education, 2009d, 2010e, 2011).

Georgia has more schools, and more impoverished schools, than the national average. According to the state's education profile, Georgia's 2,200 schools are 20% more in number than the national average; this could be due, in part, to Georgia having almost a million more households than the national average (U.S. Department of Education, 2009c). However, the number of students eligible for free or reduced lunch in Georgia is more than double the national average (U.S. Department of Education, 2009c). This could be due, in part, to Georgia having a 55% higher rate of the population at or below the poverty level, and a 56% higher rate of the households at or below the poverty level compared to the national average.

Prior knowledge. Prior knowledge is critical to learning new content and can determine the degree of student achievement. Donovan, Bransford, and Pellegrino (1999) wrote that it was essential for teachers to bring out and work with a student's preexisting knowledge, and Artino (2008) wrote that, "…the effectiveness of an instructional design depends, in part, on the learner's experience in the domain being taught" (p. 431). One finding from research was that a sufficient degree of prior knowledge made for effective transfer, and prior knowledge became a filter through which new information was incorporated by assimilation or by changing prior knowledge (Bransford & Schwartz, 1999). The goal of this study was to determine the effect on student achievement in low-SES middle schools when teachers specifically activated students' prior knowledge with cues and questions before using the LFS model of instruction.

Rationale

This project study investigated activating students' prior knowledge before using the LFS model of instruction to present the main learning goal. The specific rationale for reviewing the effect of activating students' prior knowledge before using LFS was the result of reflecting on 10 years of local CRCT scores, 10 years of inconsistent student achievement, 8 years of AYP results, 8 years of using LFS, and comparing those results to the student achievement claims and data made by the LFS organization (M. Thompson, 2009a).

As presented in Table 2, Thompson (2007, 2009a) reported substantial student achievement increases when teachers used LFS methodology in their classroom. Thompson indicated the results from 1,377 teachers for grades 6 through 8 showed 3-year, *noncumulative* substantial increases in student achievement. The average annual increase in student achievement on the standardized test scores over a 3-year period were 19% in math and 22% in reading *per year*.

Table 2

LFS Student Achievement Results for Grades 6 Through 8 for the 1998/1999 Through 2000/2001 School Years

Subject	1998/1999	1999/2000	2000/2001
Math	17% gain	18% gain	23% gain
Reading	21% gain	22% gain	24% gain

As many of the students at Tiger Middle School are in low-SES situations and may come to school with less prior knowledge (Dochy, Segers, & Buehl, 1999; Marzano,

2003c; Sirin, 2005; Stewart, 2008; Wyner et al., 2008), activating prior knowledge before using LFS would be a critical first step to improving student achievement on the local level (American Psychological Association, 1997; Dochy et al., 1999; Gagné, 1980; Garrison, 2004; Marzano, 1998, 2003c; Marzano et al., 2000b; Pacetti, 2004). LFS may not emphasize activating students' prior knowledge before presenting the main learning goal or provide the teachers the techniques to do so; therefore, not activating students' prior knowledge may account for some of the inconsistent CRCT results between the schools years 2000/2001 and 2009/2010. Another complication leading to the inconsistent results could be the difference between teachers' methods of teaching and assessing students compared to the state's standardized tests method of assessing students (Le et al., 2009). The local school district, including Tiger Middle School, implemented LFS the same school year NCLB became law; the design, implementation, or requirements of the LFS model may be a factor in the school not demonstrating consistent increases in student achievement.

Special Terms

The definitions of the key concepts or terms for this study are:

Activating prior knowledge is the act of explicitly prompting recall of personal, historical, or learned subject material; a student or teacher "calling to mind what is already known about a topic" (Division of Instruction, 1990, p. 1); or the act of helping "students retrieve what they already know about a topic" (Marzano et al., 2000b, p. 123).

Activating strategies are specific instructional strategies teachers use at the beginning of a lesson to prompt students to recall prior knowledge, motivate students, or link prior knowledge to new content (Pacetti, 2004; M. Thompson & Thomason, 2002).

Adequate yearly progress is the state's yearly measure of students' achievement as determined by standardized reading and math scores mandated by No Child Left Behind (Local County School District, 2009e; U.S. Department of Education, 2009a). AYP is the minimal level of progress toward 100% proficiency a school or district can improve on annual standardized tests (U.S. Department of Education, 2009a, para. 1).

At risk designates students who may fail in school (Z. Barley et al., 2002).

Background knowledge is "learned knowledge about a specific domain" (Marzano, Gaddy, & Dean, 2000a, p. 136).

Constructivist theory is a theory of learning that suggests students build and construct their own meaning and knowledge through learning activities, situations, ideas, and experiences that connect their personal prior knowledge with new knowledge (Abdal-Haqq, 1998; "Constructivism," 2004; Ponticell, 2006).

Corrective action is a plan where a school district implements new measures to improve a school; corrective-action measures could include replacing specific staff or implementing new curriculum, decreasing authority at the local level, appointing outside experts in advisory roles, extending the school day or year, or reorganizing the school entirely (Lefkowits & Woempner, 2006; U.S. Department of Education, 2009b).

Cues are an instructional tool to activate a student's prior knowledge with "explicit reminders or hints" (Marzano, Norford, Paynter, Pickering, & Gaddy, 2001, p.

267). Cues are an instructional technique of "providing students with a brief preview of the information or skill that is to be addressed in a lesson…. [The intent is to provide] students with a stimulus to retrieve and activate the knowledge they possess about the topic so that it might be utilized in working memory" (Marzano, 1998, p. 89).

Direct instruction is the instructional strategy "to present students with those organizing ideas in a direct fashion (as opposed to asking students to induce them) and then have students apply that general knowledge to specific situations" (Marzano, 1998, p. 100). Direct instruction is explicit, structured, and systematic designed to lead the learner successfully through a process of concept and skill development (Z. Barley et al., 2002).

Formative assessment is the process where the teacher continually monitors, observes, and collects information informally to ensure students learn and understand the skills and concepts for the main learning goal (Lynch & Warner, 2008).

Highly qualified teachers are teachers who have attained full state licensure and certification through academic degrees or examinations (U.S. Department of Education, 2002).

High-needs schools are schools where 50% or more of the population is eligible for free or reduced lunch (Mid-continent Research for Education and Learning, 2005b).

High-poverty schools are schools that are in the bottom quartile of percentages for students who are eligible for free or reduced lunch (Georgia Department of Education, 2010b).

High-performing schools are schools that score well above the state average (Mid-continent Research for Education and Learning, 2005b).

Instructional strategies are explicit actions designed by the teacher to facilitate learning.

Instructional techniques are teacher's methods used to support the learning process and aid students in learning.

Learning- focused schools refers to Thompson's (2009k) comprehensive school-wide framework model of instruction encompassing lesson planning, curriculum alignment, student assessment, school organization, and professional development designed specifically to increase student achievement.

Linking prior learning is the act of a teacher explicitly activating a student's prior knowledge with the intent to make a learning connection to new content.

Low-performing schools are schools where the scores are well below the state average (Mid-continent Research for Education and Learning, 2005b).

Low-socioeconomic status (SES) is the position in the lower portion of the stratified economic social system. Socioeconomic status is "a combination of social and economic factors" (National Assessment of Educational Progress, 2010) used to categorize income or opportunity.

Meta-analysis is the quantitative synthesizing technique "that combines the results from a number of studies to determine the net effect of an intervention" (Marzano et al., 2000b, p. 2). The net effect of an intervention (i.e., instructional technique) as determined by meta-analysis has more validity, more certainty, and greater confidence

than a single study, as many studies substantiate the value of the effect size (Marzano, 2003a).

Meta-cognition is an individual's ability to judge or discern how well they have learned, or are learning or processing a new concept, skill, or material (Bransford et al., 1986; Kendall et al., 2008; Lambert et al., 2002; Pashler et al., 2009).

Needs improvement is a designation mandated by No Child Left Behind given to schools that fail AYP for 2 consecutive years (Olson, 2006; U.S. Department of Education, 2008).

No Child Left Behind (NCLB) is the 2002 reauthorization of the Elementary and Secondary Education Act where each state is responsible for developing and implementing standards for which students are to master. Schools are to have 100% of their students achieve mastery in reading and math by 2014. An annual evaluation determines the amount of increase in student achievement toward meeting standards in each school, and each school receives a designation of *pass* or *fail* regarding AYP. For schools that fail AYP, federal sanctions are imposed in increasing measures (U.S. Department of Education, 2009a).

Preexisting understandings is general knowledge of subject matter and content, but include additional thoughts, ideas, understandings, and misunderstandings that may be accurate, inaccurate, incomplete, or misleading (Donovan et al., 2005a; Garrison, 2004).

Prior knowledge is "learned knowledge about a specific domain" as opposed to general worldly knowledge (Marzano, 2003c, p. 136) or "preexisting understandings"

(Donovan et al., 1999, p. 15). Prior knowledge is widely considered as factual or practical knowledge a person has about a specific domain (Hailikari, Katajavuori, & Lindblom-Ylanne, 2008; Muller-Kalthoff & Moller, 2006). While prior knowledge can be the result of school-specific activities and shared experiences, prior knowledge can be interpreted more broadly to include learned knowledge from family and personal experiences (Myhill & Brackley, 2004; Spires & Donley, 1998) or as the whole of a student's actual knowledge (Dochy et al., 1999).

Prior learning is previously acquired specific knowledge or skills related to a particular content, subject, material, or skill (Hawley & Rollie, 2007); also similar to old learning which is the "context or network of associated meaningful knowledge (Gagné, 1980, p. 8).

Safe harbor is a provision in "The No Child Left Behind Act [that] allows schools to meet proficiency targets by demonstrating a measure of improvement rather than proficiency. Under 'safe harbor' a school meets the AYP target if it reduces by at least 10 percent the proportion of students who scored below proficient in the previous year" (Johnson et al., 2007, p. 3).

Title I is a federally funded program for "economically and educationally disadvantaged students" (National Assessment of Educational Progress, 2010).

Significance of the Problem

Significance of the Problem in the Local Context

Even though Tiger Middle School used the LFS model of instruction each year beginning in 2002, results from the CRCT revealed the students did not demonstrate

adequate mastery of the state mandated curriculum or achieve adequate increases in annual student achievement from 2003 to 2008 (Georgia Department of Education, 2003a, 2004b, 2005b, 2006b, 2007b, 2008c). As a result, in 2003 Tiger Middle School fell under federal NCLB sanctions. The school was assigned the needs improvement label by NCLB, received help in creating a 2-year plan to correct learning deficiencies, and required to offer all students the option to transfer to another public school in the same school district (U.S. Department of Education, 2008, 2009b). Tiger Middle School received a new principal in 2004 and another in 2006, but due to offsetting inconsistent CRCT results and students' attendance patterns during that time, Tiger Middle School remained as a needs improvement school (Georgia Department of Education, 2009j, p. 39; U.S. Department of Education, 2009b). As a result of the lack of increased student achievement on the CRCT in 2007, NCLB required the school to begin free special tutoring and academic services apart from the regular school day (U.S. Department of Education, 2008, 2009b). When the students did not demonstrate adequate increased student achievement in 2008, NCLB increased the school's needs improvement label to NI-2 (U.S. Department of Education, 2008, 2009b). When Tiger Middle School received another principal in 2008, overall student achievement increased for the 2009 school year, but NCLB required that the school remain in corrective action NI-2. In 2010 with the removal of the students with disabilities subgroup and enough overall increase in student achievement on the CRCT, Tiger Middle School was removed from the needs improvement list (Georgia Department of Education, 2009b, 2010a).

The Local County School District is a Title I school system, and according to NCLB, has never demonstrated adequate increases in student achievement (Georgia Department of Education, 2004a, 2005a, 2006a, 2007a, 2008b, 2009c, 2010d). This problem is significant at the county level because there are over 28,300 students in the school district, and students are not consistently demonstrating mastery of the Georgia Performance Standards curriculum or showing adequate yearly increases in student achievement on the CRCT (Local County School District, 2010b).

On the student level, failing the basic requirements of the reading or math portion of the CRCT could result in the student being retained in the current grade level (Georgia Department of Education, 2008e, 2009o, 2010h, 2010i). After failing the reading or math portion of the CRCT, the school must notify the parents of the results, and the student retested. If the student fails the retest, the school notifies the parents that the student must be retained, and the parents are given instructions on how to appeal. If the parents appeal, then the principal must create a committee, which includes the parent, principal, and teacher, to review the current academic progress of the student and plan for future, ongoing assessments to monitor progress (Georgia Department of Education, 2008e); "the committee must be unanimous in its decision to promote the student" (Georgia Department of Education, 2008e, p. 1). Students who continue to fail the minimum requirements of the CRCT could be evidence of students not learning the Georgia Performance Standards curriculum.

As most students who have failed the CRCT from Tiger Middle School have been placed into high school, complications from not learning the curriculum in middle school

could consist of not passing the Georgia High School Graduation Test, the End of Course Test, and not graduating with a diploma. The national average of graduating students from a secondary school similar to Local County High School (LCHS) in 2010 was 88% (Aud et al., 2010). The combined graduation rate for the four high schools in the county was 82.1% in 2010 (Georgia Department of Education, 2010b). The high school that the majority of Tiger Middle School students attend (LCHS) has a graduation rate of 75.4% for 2010, 12.6 percentile points lower than the national average (Georgia Department of Education, 2010b). The significance of students not increasing their achievement on standardized tests, as an indicator for AYP, extends past the local area.

Significance of the Problem in the Larger Educational Context

There were approximately 100,000 schools in the United States and in 2006, and 30% of the schools in the nation did not show enough increased student achievement for the school to meet AYP (Herman et al., 2008b; "No Child Left Behind (NCLB)," 2004). While there has been a general trend of more students increasing their achievement to meet the proficient level since 2002 (Center on Education Policy, 2009a), the goal of 100% student pass rate in 2014 seems ambitious and practically unrealistic; it is probable that more schools will fail AYP (Center on Education Policy, 2011; Futrell & Gomez, 2008; Georgia Department of Education, 2003b; Mid-continent Research for Education and Learning, 2002; Nichols & Berliner, 2008; Olson, 2006; Rothstein, 2008). Plucker, Burroughs, and Song (2010) pointed out that the National Assessment of Educational Progress' data suggested that, in the age of NCLB, the achievement gap has actually widened between low- and high-SES groups. Tomlinson commented (as cited in Mid-

continent Research for Education and Learning, 2004) that, "'When our focus is solely on testing, struggling students may not be able to win,'" (p. 8) and because of the nature of their disability, some mildly disabled students may not ever be capable of demonstrating grade-level mastery of the curriculum.

The problem of students demonstrating consistent increases in student achievement is pertinent particularly for teachers in low-SES middle schools who are likely to teach students with less prior knowledge compared to their higher-SES peers. Chudowsky, Chudowsky, and Kober (2009) noted that schools and teachers might not be prepared to teach low-performing students effectively. Effective teachers in high-needs, high-performing schools provided a clear structure, individualization of learning activities, and opportunities to interact with quality learning experiences (Mid-continent Research for Education and Learning, 2005b). Teachers of low-SES students, who may come to school with less prior knowledge, need to use the most effective instructional strategies to increase student achievement consistently (Z. Barley et al., 2002; Goodwin, 2010a; Haycock & Crawford, 2008; Hollins, 2006; Payne, 2008; Slavin et al., 2009). As the number of students improving their achievement by meeting state standards increases, generally the number of students exceeding the state standards increases (Jacobson & Holian, 2010).

If Tiger Middle School has not specifically activated students' prior knowledge and not reached the levels of success in increasing student achievement as suggested by LFS (M. Thompson, 2007), it is possible that other schools using LFS and not specifically activating students' prior knowledge are not reaching their student

achievement goals either. As the data extrapolate, the significance of schools demonstrating adequate improvements in student achievement increases. Thompson (2009a, 2009i) noted that in 2003, over 2,000 educational facilities in the United States used the LFS model of instruction with 381 of those facilities being Title I schools. Riedl (2009) noted that LFS has "grown and transformed into one of the largest providers of school improvement materials and training in the United States" (para. 2) where LFS has conducted seminars, workshops, and training sessions in 20 states. LFS conducted 1,450 workshops and sessions in 2007 alone (Riedl, 2009). There are examples, Riedl noted, where two entire states implemented LFS model of instruction. According to Riedl, in 2007, LFS was affecting 20 states, 290 school districts, 3,200 schools, 92,000 classrooms, 111,000 teachers, and over the past 5 years, 2.8 million students (para. 5).

LFS has produced inconsistent student achievement results at Tiger Middle School. The LFS model of instruction might not promote activating students' prior knowledge to the degree necessary for students to demonstrate annual increased student achievement at a low-SES school. Results of this ex post facto (after the fact) project study could provide data to help determine if activating prior knowledge before using the LFS model of instruction increases student achievement. If there is a design flaw relating to activating students' prior knowledge in the LFS model of instruction, then the impact could be widespread.

Research Question

The problem this study addressed is: Is there an effect on student achievement in low-SES middle schools when teachers specifically activate students' prior knowledge with cues and questions before using the LFS model of instruction?

Purpose

The purpose of this ex post facto study was to test the principle for the construction of knowledge that related a teacher activating students' prior learning, with cues and questions, before using LFS and the achievement of students in low-SES middle schools. The local and district administrators provided the archival data. The definition for the independent variable was a teacher activating students' prior learning with cues and questions as represented by the archival records, and the definition for the dependent variable was the students' achievement as determined by the posttest assessment records. The definition for the control variables were the records representing the students' pretest assessment results by class and the students' grade level.

Audience

The audience for this project study is the local board of education, superintendent, principals, instructional lead teachers, department heads, teachers, the general public, and any audience that has a vested interest in Tiger Middle School, increased student achievement, or LFS (Hendricks, Plantz, & Pritchard, 2008). Results will be shared with stakeholders for their review, and this study was conducted with their interests in mind (Gangopadhyay, 2002). Stakeholders will be encouraged to provide input as to how

instruction, activating prior knowledge, or the LFS program could be modified, improved, or otherwise adjusted to meet the desired increases in student achievement.

Past Research

A substantial amount of research has been conducted on the construction of knowledge (Marzano, 2010; Ponticell, 2006), prior knowledge (Bransford et al., 2000; Marzano, 1998; Marzano et al., 2000b), how prior knowledge is added to or changed by new content (Vosniadou, 2007), domain-specific knowledge (Bransford et al., 1986; Garrison, 2004; Spires & Donley, 1998), effects of low-SES environments on student achievement (Planty et al., 2009; Sirin, 2005; Wyner et al., 2008), teacher effect on student achievement (Barber & Mourshed, 2007; Bransford et al., 2000; Garrison, 2004; Goodwin, 1999; Haycock & Crawford, 2008; Marzano, 2000; McLeod, 2005; K. Miller, 2003), instructional techniques to activate students' prior knowledge (Gaddy et al., 2002; Spires & Donley, 1998), and instructional strategies in general (Division of Instruction, 1990; Donovan et al., 1999; Garrett, 2007; Taylor, Van Scotter, & Coulson, 2007). As the research-base increases, there is an emerging picture suggesting that low-SES factors do affect student achievement, students from low-SES environments are likely to have less prior knowledge than their higher-SES peers do, and prior knowledge is a critical variable for learning new content (Barton & Coley, 2009a; Planty et al., 2009; Stewart, 2008; Wyner et al., 2008). However, all students deserve the kind of education found in high-performing schools (Simons & Friedman, 2008). Past researchers have shown that an effective classroom teacher can offset some of the low-SES effects (American

Psychological Association, 2008; Brown, Anfara, & Roney, 2004; Marzano, 2000, 2003c; Marzano et al., 2000a; Williams, Kirst, & Haertel, 2005).

One of the roles of the teacher is to help students recall what they know about a topic, or activate students' prior knowledge, before presenting the main learning goal thereby allowing students to retain new content (Gagné, 1980). Researchers have identified effective instructional strategies specifically for low-SES students and for students in general (Marzano, 1998). As students from low-SES environments may have less prior knowledge which could affect their academic achievement (Aud et al., 2010), teachers in low-SES schools need to use the most effective instructional strategies consistently (Z. Barley et al., 2002; Haycock & Crawford, 2008; Hollins, 2006; Payne, 2008; Slavin et al., 2009). As Marzano (1998) pointed out, there is a relationship between activating students' prior knowledge and increasing achievement for low-SES students.

Marzano (2003c) noted that effective teachers increase student achievement approximately 50 percentage points in 1 school year while ineffective teachers may contribute only a 14 percentage point gain; researchers calculated that most students gain 34 percentage points just by growing 1 year older. Goodwin (2010a) noted that the difference in student achievement in a single school year from a highly effective teacher could be a gain as much as a year and a half versus a highly ineffective teacher who could increase student achievement as little as one half year—a potential difference in student achievement of an entire school year. Sanders noted (as cited in Goodwin, 2010a) that students who may have ineffective teachers for 3 years may score "as much as 50

percentile points lower on statewide assessments" (p. 7) than students who have highly effective teachers. Barley et al. (2002) recalled Marzano's (2000) analysis providing ratios of the factors for student achievement where that the teacher contributes 13.4% of the variable for student learning, the school contributes 6.6%, and the student variables (e.g., SES conditions, culture) contribute the remaining 80%.

Local Problem

Thompson's (2009a) data from 1,377 teachers using LFS in sixth through eighth grade indicated after LFS implementation, students increased their math scores 17% the first year, 18% more the second year, and 23% more the third year. The school district acted on Thompson's (2009a) claim that LFS had a particularly positive impact on low-income students and began initial implementation of LFS training for all school and district staff in the fall of 2002 in accordance with LFS guidelines through the Northwest Georgia Regional Educational Service Agency and LFS personnel (Y. H., personal communication, March 25, 2010). All certified personnel attended a full day orientation presentation conducted by the LFS organization designed to introduce and outline the LFS model. For the remainder of the 2002 school year, regularly scheduled professional development meetings developed the model for implementation in the classroom.

In the fall of 2003 with the assistance of LFS personnel, the local school district began conducting professional development sessions according to subject matter in an effort to implement the model throughout all subjects and all grade levels. Tiger Middle School's chorus teacher was in charge of conducting a professional learning session for all the general music and chorus teachers for the county but had noticed there were few

strategies and activities related to music in the LFS strategies notebook. Through an electronic mail communiqué to the LFS headquarters, the chorus teacher asked Thompson for working examples and strategies on how to utilize the LFS system in the general music and chorus classroom. Thompson responded that, "most of the music/chorus teachers we see use the strategies…only occasionally during their band or chorus classes" (M. T., personal communication, September 22, 2003). Not only did Thompson downplay the role and use of LFS in band or chorus classes but also failed to suggest that other effective instructional strategies, such as activating students' prior knowledge, would be effective in helping students learn and retain content.

Even though Tiger Middle School correctly implemented the LFS model of instruction as per the guidelines, methods, and instructions of the LFS organization, the school did not see the increases Thompson (2009a) claimed. According to the CRCT reports from 2003, 71% of the students at Tiger Middle School met or exceeded the math standards, and 8 years after LFS implementation, 78.9% of the students had met or exceeded the math standards—a total increase of 8.9 percentage points (Georgia Department of Education, 2003a, 2009f). For the reading portion of the CRCT in 2003, 74% of the students at Tiger Middle School met or exceeded the standards, and in 2010, 89.9% met or exceeded the standards—a total increase of 15.9 percentage points in 8 years (Georgia Department of Education, 2003a, 2010a).

Even though there is a relationship between activating prior knowledge and increased achievement for low-SES students (Marzano, 1998), the implementation of LFS across the county simply involves EATS: essential question, activating strategy,

teacher instruction, and summarizing—an instructional outline that does not intentionally activate students' prior knowledge (M. Thompson, 2009e). As evidenced by erratic scores on the CRCT, using LFS alone has not provided success for the county's students in demonstrating knowledge of the Georgia Performance Standards; many of the county's schools are still under federal sanctions (Georgia Department of Education, 2003f, 2004a, 2005a, 2006a, 2007a, 2008b, 2009c, 2010d). For the district to achieve the goal of all schools demonstrating increased student achievement annually on the CRCT, teachers could continue to use of LFS to bridge strategies across units, select appropriate instructional strategies for specific lessons and content (Cargill, 2009; M. Thompson, 2009g), but activate all students' prior knowledge before beginning LFS.

Gaps in Past Research

There appear to be some gaps in the past literature regarding instructional strategies, student achievement, low-SES schools, and LFS in general. There is research of effective instructional strategies specifically for high-achieving students or for low-achieving students, but not for both groups. Barley et al. (2002) suggested further research on a single, specific instructional strategy that may be effective for teaching high- and low-achieving students:

> Empirical confirmation [is needed] through research studies designed to compare the effects of a strategy on high- versus low-achieving students. Such research could provide much-needed information on the most effective ways to implement instructional strategies that can help all students to learn. (p. 113)

Slavin, Lake, and Groff (2009) pointed out that there was a need to know if certain teaching strategies were effective for disadvantaged or minority students. Wyner, Bridgeland, and Dilulio (2008) concluded their report hoping that there will be further investigation to determine the most effective teaching strategies for high-achieving, low-SES students. Other reports recorded a need for research to determine if instructional strategies that work for the broad middle portion of students are equally effective for the low- and high-achieving students (Chudowsky et al., 2009). Khadaroo (2010) noted that attention to research specific to low-SES students was still an emerging area, but there were efforts to pair stronger teachers with low-SES students to close achievement gaps. Pashler et al. (2009) noted that there is a body of evidence indicating that activating a student's prior knowledge before written assignments improves learning, but there is "little or no published experimental evidence" (p. 19) that activating a student's prior knowledge is effective when teachers present material orally—the typical delivery method of regular classroom instruction. Hickey (2006) recommended conducting research in a Georgia school to determine if LFS was effective in increasing student achievement after implementing the Georgia Performance Standards. Lastly, Pate and Gibson (2005, pp. 1, 7) indicated that there is a need for current research to determine whether LFS was actually effective at all in raising student achievement.

Research Needed

The type of research to address some of these gaps in the literature is an ex post facto project study investigating the effect of activating students' prior knowledge before using LFS to present the main learning goal. A project study may be able to determine

why local, standardized test results do not match the increase in student achievement claims promoted by LFS. This project study will review archival records representing students' pre and posttest assessment scores, CRCT results, AYP data, and the LFS model of instruction as it relates to a low-SES middle school.

Literature Review

The literature review consisted of finding specific and related scholarly articles, research studies, dissertations, reports, meta-analytic summaries, Internet web sites, electronic articles, books, and government documents to create a broad understanding of the current and predominant ideas regarding low-SES situations, LFS model, effect of prior knowledge, appropriate instructional strategies, and teacher effectiveness. Presented here are the most relevant concepts and sources related to the problem at Tiger Middle School. Of particular interest are the effect of low-SES situations, reduced prior knowledge for low-SES students, appropriate instructional strategies for students from low-SES situations, and the LFS model of instruction.

Theoretical Base and Conceptual Framework

The overarching theory for this study was learning theory, cognitive learning theory, and the principle for the construction of knowledge as suggested by the American Psychological Association (2008, "Construction of knowledge"; Bransford et al., 2000; Donovan et al., 1999; Learning Theories Knowledgebase, 2008). The construction of knowledge is the intentional learning process where the student links new information with prior knowledge (American Psychological Association, 2008, "Construction of knowledge"). The constructivist learning theory (constructivism) provided a supporting

element for this study (Le et al., 2009; Vosniadou, 2007), and instructional strategies, a component of learning theory, will be further limited in this study to specific aspects of teacher techniques to activate students' prior knowledge.

For effective content retention, new learning must be linked to a student's prior knowledge (American Psychological Association, 1997; Bransford et al., 1986; Donovan et al., 1999; Gagné, 1980; Garrison, 2004; Hawley & Rollie, 2007; Pacchiano, 2000; Vosniadou, 2007). Prior knowledge should be activated before students begin new content (Bransford et al., 2000; Gaddy et al., 2002; Gagné, 1980; Pacchiano, 2000), and students in low-SES environments may have less prior knowledge than their higher-SES peers do (Hollins, 2006; Pacetti, 2004; Sirin, 2005; Stewart, 2008; Wyner et al., 2008). Proven effective teaching strategies to activate students' prior knowledge include using cues and questions to access a student's level of understanding and using graphic representations to organize content (Gagné, 1980; Marzano, 1998; Marzano et al., 2000b; Marzano, Norford, et al., 2001; Mitchell, 2006; Myhill & Brackley, 2004; Phillips, 2009b; Spires & Donley, 1998; Sternberg, 2006; Swanson, 2001; M. Thompson, 2009k; A. W. Wright & Bilica, 2007).

Many educational and environmental factors contributed to the problem at Tiger Middle School. For this study, five categories grouped the main elements: students' prior knowledge, low-SES factors, the teacher and instructional strategies, reform, and LFS. Specific factors involved in students' prior knowledge included accuracy, breadth, and domain-specific knowledge. Factors related to low-SES included the effect of low-SES on student achievement and on a student's prior knowledge. Factors related specifically

to the teacher and instructional strategies were the role of teachers in activating a student's prior knowledge, teachers' means to determine a student's prior knowledge, the effectiveness of teachers in general, effective instructional strategies for low-SES students, differentiated learning strategies, and formative assessments. Factors related to reform included research-based local educational reform; turn around schools; and differences between high- and low-performing, high-needs schools.

Prior Knowledge

Basic to learning. In a meta-analytic review summarizing research of 183 studies, Marzano (2003c) noted that analysis demonstrated 91.5% of the studies showed positive relationships between prior knowledge and learning with 30% to 60% of the results explained by prior knowledge only; the remaining studies showed either indirect relationships or unclear or invalid results. The following researchers have showed the importance of prior knowledge to student learning:

- Prior knowledge accounts for the largest variable in student achievement (Marzano, 2000; Wilson et al., 2006).
- Prior knowledge is the basis for all future knowledge (Marzano et al., 2000b).
- Prior knowledge "constitutes a starting point for the construction of new knowledge" (Garrison, 2004, p. 378).
- Prior knowledge can be a significant and accurate predictor of performance and facilitates new learning (R. A. Thompson & Zamboanga, 2004).
- Prior knowledge is a fundamental factor for learning new material (Myhill & Brackley, 2004).

- Prior knowledge is critical to learning new information (Gagné, 1980).
- Prior knowledge enhances learning about new material (Marzano, Norford, et al., 2001).
- Prior knowledge of the student largely determines a teacher's effectiveness (A. Jones, Todorova, & Vargo, 2000).
- Prior knowledge influenced comprehension much more than earlier research indicated and "is a better predictor of comprehension than is either an intelligence test score or a reading achievement test score" (Division of Instruction, 1990, p. 1).
- Prior knowledge allows a student to understand a topic (R. A. Thompson & Zamboanga, 2004).
- Prior knowledge facilitates learning and allows students to "encode and store information in long-term memory [from] links to personal experience and knowledge" (Kruse, 2010, para. Stimulate recall of prior learning)
- Prior knowledge and a student's experiences play a significant role in learning new material (Le et al., 2009).
- Students with higher prior knowledge tend to achieve more (R. A. Thompson & Zamboanga, 2004).
- Prior knowledge and student characteristics had a larger impact on student achievement than instructional practices (Le et al., 2009).
- Prior knowledge enhanced comprehension and students' performance improved (Spires & Donley, 1998).

- Prior knowledge and a student's personal history influences, and has an effect on, how and what students learn (McGee, Almquist, Keller, & Jacobsen, 2008; R. A. Thompson & Zamboanga, 2004).
- Prior knowledge and background characteristics play a larger role than educational interventions (Le et al., 2009).
- Prior knowledge promotes growth of new learning through interaction (Dochy et al., 1999; Le et al., 2009; Myhill & Brackley, 2004).
- Prior knowledge was an important asset when reading new material; students merged prior knowledge with new text to comprehend the new reading material (Johnston & Pearson, 1982; Spires & Donley, 1998).
- Prior knowledge allows students to be more successful in minimally guided instructional tasks (Kirschner, Sweller, & Clark, 2006).
- When prior knowledge and interests were linked, student motivation increased (Mitchell, 2006).
- Prior knowledge not only effects unconscious behavior but also plays a role in deliberate choices (Betsch, Brinkmann, Fiedler, & Breining, 1999).

There is a high correlation between a student's prior knowledge and performance in intellectual tasks. Domain-specific prior knowledge can offset low intelligence, but high intelligence cannot offset a lack of prior knowledge (Dochy et al., 1999). Effective instruction and student achievement are dependent on what prior knowledge students bring into the classroom (Garrison, 2004). Prior knowledge, however, may not always be correct.

May be accurate. Prior knowledge can be accurate, inaccurate, incomplete, or misleading. Students' prior knowledge acts as a filter for new learning (Wilson et al., 2006), and new learning acts to build on or change a student's prior knowledge (Vosniadou, 2007). A student's prior knowledge, if accurate, provides a foundation or springboard for new learning (Dochy et al., 1999; A. W. Wright & Bilica, 2007).

If a student's prior knowledge if incorrect, inaccurate, or misleading, it can actually hinder learning new content or be detrimental to accurate learning (R. A. Thompson & Zamboanga, 2004). Incorrect prior knowledge can interfere with new learning and can offset the beneficial effects of prior knowledge (Dochy et al., 1999). If students receive correct information but their prior knowledge is incorrect, students may resist or reject the new content (McGee et al., 2008; A. W. Wright & Bilica, 2007).

When teachers plan to correct a student's inaccurate prior knowledge, Wright and Bilica (2007) suggested, the teacher should determine the level of a student's prior knowledge, adjust lesson plans accordingly, and incorporate a student's prior knowledge in the lesson. Knowing a student's inaccurate prior knowledge could help a teacher plan a lesson that promotes a student's conceptual change of that inaccurate knowledge and build on the new, accurate knowledge (Reinhart, 2000; A. W. Wright & Bilica, 2007). Students' prior knowledge is not limited to a specific subject.

Can be broad. Prior knowledge can be about facts, experiences, social situations, and cultural norms, but it can also include cognitive connections. Students' prior knowledge can consist of school related knowledge or personal experiences (Spires & Donley, 1998). Myhill and Brackley (2004) noted that having students use their prior

knowledge of finding the area of a square could help them find the area of a compound shape. Teacher's subject-level learning goal and lesson activities can incorporate students' background knowledge.

Activating a student's prior knowledge. "The activation of prior knowledge has been shown to be critical to learning of all types" (Marzano et al., 2000b, p. 133) and background knowledge influences what students perceive. There is a relationship between activating a student's prior knowledge and increasing achievement for low-SES students (Marzano, 1998). Donovan et al. (1999) noted that it is essential for teachers to bring out prior knowledge in their students. This is a "fundamental insight about learning: new understandings are constructed on a foundation of existing understandings and experiences" (2005b, p. 4). Teachers should not be passive transmitters of knowledge by simply giving new content to students, but rather become active participants in the learning process by linking students' prior knowledge to new material (Myhill & Brackley, 2004). Teachers who active a student's prior knowledge promote student learning (Division of Instruction, 1990), and Gagné (1980) suggested that activating student's prior knowledge was "an essential element in instructional planning" (p. 9). Teachers can easily access a student's prior knowledge.

Role of the teacher. Marzano, Gaddy, and Dean (2000b) wrote that use of students' prior knowledge "can be a powerful learning tool" (p. 133). A teacher activating a student's prior knowledge is the basis for that student learning new content. The instructional strategy of activating prior knowledge is vital for the learner to link "new information with existing knowledge…. [If the link to prior knowledge is not

established] this new knowledge remains isolated, cannot be used most effectively in new tasks, and does not transfer readily to new situations" (American Psychological Association, 2008). Teachers can activate a student's prior knowledge with cues and questions (Gaddy et al., 2002; Marzano, 1998; Marzano et al., 2000b; Marzano, Norford, et al., 2001), and questions should "focus on what is important" (Marzano, Norford, et al., 2001, p. 265) about the prior knowledge. Questions easily access a student's prior knowledge and can pertain to a student's prior experiences, previous curriculum concepts, or earlier units of content (Kruse, 2010).

Kameenui and Carnine's review (as cited in Rockwell, 2007) of 30 years of research on instructional strategies that spanned grade levels, subjects, socioeconomic status, culture, and disabilities, found that the most effective instructional strategies started with activating prior knowledge. Christen and Murphy (1991) reported that activating prior knowledge was essential to learning and moved students from memorization to meaningful learning. As part of the lesson design, teachers should specifically, intentionally, and explicitly activate a student's prior learning and relate new learning to prior knowledge; the more prior knowledge a student has on a topic, the more they will understand and recall (Pacchiano, 2000; Pacetti, 2004; Taylor et al., 2007). Dong (2009) noted that a student's prior knowledge plays "important roles in learning subject-matter knowledge" (p. 28) and teachers can and should activate a student's prior knowledge before starting the main lesson.

To create an environment conducive to learning, teachers have the responsibility to identify students' prior knowledge and use that awareness when planning instructional

lessons (Black & Wiliam, 2009; Gagné, 1980; Holmqvist, Lindgren, Mattisson, & Svarvell, 2008; Myhill & Brackley, 2004; Taylor et al., 2007; Wilson et al., 2006; A. W. Wright & Bilica, 2007). During the lesson, the teacher should activate students' prior knowledge, then build on, adjust, or correct that prior knowledge (Black & Wiliam, 2009). Myhill and Brackley (2004) noted that teachers should strive to connect new learning with students' previously acquired learning, whether that prior knowledge is from school or from life, and Gagné (1980) suggested related learning could aid in new learning.

Myhill and Brackley (2004) also noted teachers should strive to understand a student's prior knowledge, especially if that knowledge is only partially correct, and build on that knowledge the foundational concepts and principles so that the student can move forward in their content knowledge. Vosniadou (2007) suggested that students are not able to change inaccurate prior knowledge on their own in a Piagetian developmental fashion, but need direct, explicit, intentional instruction for changes to take place; Vosniadou noted current research suggested direct instructional methods to change inaccurate prior learning can even bypass Vygotskian social learning theory as, ultimately, learning is an individual endeavor. Teachers can gain an understanding of their students' prior knowledge.

Teachers determining prior knowledge. Teachers can specifically, directly, and explicitly activate a student's prior knowledge (Dong, 2009; Gagné, 1980; Mitchell, 2006; Spires & Donley, 1998; A. W. Wright & Bilica, 2007). Marzano (1998) showed that using intentional cues and questions, nonlinguistic representations (graphic

organizers), and various forms of advanced organizers activate students' prior knowledge (Gaddy et al., 2002; Marzano et al., 2000b). Wright and Bilica (2007) suggested that the key to determining students' prior knowledge was to ask students questions and then listen to what the students had to say. Kruse (2010) recommended that the teacher ask questions about students' prior knowledge, about their understanding of earlier content, or about a body of content in general. For the main learning goal of that day, teachers should inquire about students' specific prior knowledge for that lesson.

Domain-specific knowledge. What students already know about a topic will influence how they respond to new information on that topic (Myhill & Brackley, 2004). As Thompson and Zamboanga (2004) wrote, "Domain-specific prior knowledge facilitates student learning" (p. 778) and domain-specific knowledge aids student achievement. Long and Prat (2002) noted that as experience in the subject domain increases, domain-specific recall, recognition, and memory increases. What individuals learn depends on what they already know; learning involves the transfer from what is known to new material (Bransford, Brown, Cocking, & National Academy of Sciences-National Research Council, 1999). Bransford (1999) noted "all new learning involves transfer based on previous learning, and this fact has important implications for the design of instruction that helps students learn" (p. 67). Donovan and Bransford (2005a) agreed with the principle that new knowledge needs to build on prior knowledge and engage students' prior understandings (p. 219). Bransford and Schwartz (1999) noted, "effective transfer requires a sufficient degree of original learning" (p. 64). However, another view of transfer of domain-specific knowledge involves the idea that transference

does not have to be precisely domain-specific, but rather similar, and not identical, situations use foundational knowledge, concepts, and general principles (Gagné, 1980; Mayer, 2004, p. 717). Other factors also affect student achievement.

Low-SES

A student's background characteristics "are the most important determinants of student achievement" (Marzano, 2003c, p. 123) and play a larger role than school practices (Henig, 2008). Barton and Coley (2009a) concluded that, "from the research and statistics now available…it remains clear that minority students and poor students continue to face conditions that undermine school achievement" (p. 33). Haycock and Crawford (2008) stated, "The bottom line is clear. Poor and minority students often enter school behind other students" (p. 16). Low-SES conditions can have an adverse effect on students and be one of the best predictors of (low) student achievement (Marzano, 2003c; Williams et al., 2005). Goodwin (2010a) reiterated Marzano's (2000) research that 80% of the variables that impact a student's achievement fall into four areas—home environment (as much as 33%), prior knowledge (as much as 41%), aptitude, and interest and motivation. Students from low-SES conditions come to school with less prior knowledge (Payne, 2008).

General effects. Low-SES environments contribute to students not achieving as easily as students from high-SES environments. Students from low-SES situations may

- have more absences from illnesses due to lack of health care,
- have a lower birth weight and may later develop asthma,
- have more lead poisoning and iron deficiency,

- suffer from nutrition deficiency,
- spend excessive time watching television,
- have less cultural awareness,
- live in a higher crime rate environment,
- live with more economic stress, and
- have significantly less vocabulary (Barton & Coley, 2009b; Payne, 2008; Rothstein, 2008; Simons & Friedman, 2008).

Mobility. Smith, Fien, and Payne (2008) noted that student mobility had significant consequences for individual students. Smith et al. indicated that students might have decreased nutrition, lower academic achievement, increased health problems, or an increase in grade retention. Mobility disproportionately affected students in low-SES conditions causing, among other things, a loss of educational continuity resulting in students falling behind academically (Barton & Coley, 2009b; Simons & Friedman, 2008; Smith et al., 2008). Beesley, Moore, and Gopalani (2010) noted that students who do not stay in one school for the entire year have lower academic achievement, drop out at higher rates, and are disciplined more frequently. At the elementary level, researchers noted that mobile students could have as much as a 3- to 4-month academic disadvantage (Beesley et al., 2010). Low-SES students may lack sufficient knowledge of their own learning needs; may require direct instruction for concepts, skills, and transfer; may have less prior knowledge; and have more difficulty in making "links between prior knowledge and new content" (Rockwell, 2007, p. 9). The general effects of low-SES begin with the environment created in a student's home.

Home environment. There is a complex relationship between student achievement and low-SES conditions (Z. Barley et al., 2002; Barton & Coley, 2009a; Marzano et al., 2000b). The home atmosphere, as an isolated variable from income, education, and occupation, had more than twice the effect size on student achievement than did income alone (Marzano, 2003c; Marzano et al., 2000a, p. 127; Milne & Plourde, 2006); parental education, occupation, and income effect student achievement only 10% (Goodwin, 2010a). Through meta-analytic research of 101 reports, researchers found that "the most important aspect of SES… [was the] home environment" (Marzano et al., 2000a, p. 127). The most influential aspects of the home environment were parental interest and communication about their child's schoolwork, parental supervision and monitoring of their child's behavior, and parental expectations (Marzano et al., 2000a). Low-SES parents may hold the same high educational values as high-SES parents and want the same educational benefits, but may not have access to transportation, paid time off, or childcare to attend school functions (Antonio, 2008; Futrell & Gomez, 2008; Gorski, 2008).

Parental influence. Researchers using data analysis of 118 research studies revealed that low-SES conditions, including single-parent families and a mother's low education level, influenced low student achievement (Z. Barley et al., 2002). Barton and Coley (2009b) noted that students who had two-parent families had a better chance of succeeding in school than those with single-parent families; 74% of White children have two-parent families, 66% of Hispanic children, and 35% of Black children live in two-parent families. Hart and Risley (2003) reported that after 4 years, children living in a

professional family would have encountered 45 million words, 26 million words from a working-class family, and 13 million words from a welfare family—a potential difference of 30 million words. Payne (2008) noted that students might come to school with less prior knowledge and "fewer family supports" (p. 48) than higher-SES students do. The influence of low-SES environments and parental influence begin early in a student's life.

Early effects. The United States government found that children in poverty do not fare as well as children from higher-SES families and are "much more likely to have difficulty in school" (Federal Interagency Forum on Child and Family Statistics, 2009, p. 14). Rothstein (2008) noted that due to poor medical care, low-SES students may have more illnesses causing a higher rate of absenteeism, and Gorski (2008) noted that students living in low-SES conditions live in an environment that "limit their abilities to achieve their full potential" (p. 35). Low-SES conditions can have an effect on cognitive skills on children as early as 9 months (Planty et al., 2009). By the age of 2 years, the differences in cognitive development between children in poverty and those above poverty become significant (Planty et al., 2009). The differences in cognitive skills for 9 month old children is 3 percentage points, for 2 year old children the difference is 12 percentage points, and for 4 year old children the difference is 27 percentage points; "the problem of low-SES increases as the children get older" (Planty et al., 2009, p. 8). Goodwin (2010a) noted that, by the time students enter school, children from poverty may score 60% lower on cognitive tests than middle-SES students and have heard 30 million words less than their higher-SES peers have. The early effects of low-SES conditions in the home can affect a student's success in school.

School. Hollins (2006) suggested that students in low-SES conditions often do not have the same advantages as their higher-SES peers, may persistently perform lower-than-average, and, as a result, need higher-quality teaching. In a 2009 report of a major metropolitan school district in Georgia, students who were eligible for free or reduced lunch scored 30 points lower on average than their peers who were not eligible for free or reduced lunch; the 2009 scores were not significantly different from the 2003 scores (National Center for Education Statistics, 2009b). Rothstein (2008) noted that as long as the inequalities in socioeconomic status remain vast, the achievement gap (between students and schools) would remain. Khadaroo (2010) indicated that higher poverty schools have less experienced and less qualified teachers. In the state of Georgia, the high-poverty schools in fact do have almost 2.5 times the number of teachers who are not highly qualified compared to the upper quartile schools (Georgia Department of Education, 2010b). Low-SES students need more instructional time to offset low-SES effects (Parrett & Budge, 2009; Payne, 2008). Schools leaders can instill a belief that all students in their school can learn; maintain an orderly school environment; implement shared norms, values, and expectations; insist teachers use clear learning goals; and ensure teachers explicit, direct instruction and feedback (Mid-continent Research for Education and Learning, 2005b).

The Teacher and Effective Instructional Strategies

Teacher impact. Marzano (2003c) summarized that, "the impact of decisions made by individual teachers is far greater than the impact of decisions made at the school level" (p. 71). Wright, Horn, and Sanders (1997) concluded from a study of 60,000

students that, “the most important factor affecting student learning is the teacher” (p. 63) and “effective teachers appear to be effective with all students of all achievement levels” (as cited in Marzano, 2003c, p. 72). Surveying 23 countries, Schleicher (2009) suggested that the greatest differences in effective instruction came from the individual teacher and not the school or the individual country. Schleicher went on to indicate that the quality of the “educational system cannot exceed the quality of its teachers” (p. 50). Researchers have shown that the teacher-level impact on student achievement is twice that of the school-level impact—13.4% for teacher-level effect and 6.6% for school-level effect (Goodwin, 2010a; Marzano, 2000). Effective teachers create environments where there are maximum opportunities for student learning (Brookhart, Moss, & Long, 2008). Goodwin (2010a) noted that highly effective teachers could increase a student’s learning in 1 school year by as much as a year and a half. Teachers can be effective apart from the overall impact of the school or the student (Kyriakides, 2008) and can offset some of the low-SES effects on a student’s achievement (Brown et al., 2004; Marzano, 2003c; Williams et al., 2005). Haycock and Crawford (2008) noted that there are significant differences in the “amounts and kinds of learning different teachers help produce” (p. 14) in their students. Teachers can offset some of the low-SES influences by consistently using known, effective instructional strategies.

Effective strategies. While changing a school’s culture of practice and teachers’ instructional methods is the starting point of improving student achievement, teachers in low-SES schools need to use the most effective instructional strategies, and schools need to use the most effective programs when teaching low-SES students (Z. Barley et al.,

2002; Hollins, 2006; Payne, 2008; Popham, 2008; Slavin et al., 2009). Researchers suggest that, "the only way to improve [student] outcomes is to improve instruction" ("Characteristics of the world's high-performing school systems," 2008, p. 9). While Goodwin (2010a) noted researchers have identified many effective instructional strategies, Marzano (2009) indicated a few strategies have been identified that reach across all grade levels and all subject matters. One of the instructional strategies that applies to all learning goals is helping students "identify what they already know about the topic" (Marzano, 1998, p. 134) or activating prior knowledge. Marzano (2003c) wrote that, "effective teachers use more effective instructional strategies" (p. 78), and instruction should be a set of events "designed to support learning" (Gagné, 1973, p. 3). According to Scherer (2008), the main way to improve student achievement for students at risk is through good teaching, and Marzano (1998) noted that an effective teacher is one "who has clear instructional goals" (p. 135). Goodwin (2010a) elaborated on Marzano's idea saying that researchers have summarized decades of research and suggested that effective teachers: (a) set high learning expectations for their students and provide challenging instruction, (b) create engaging environments and foster meaningful relationships with their students, and (c) intentionally use specific instructional strategies to specific learning goals. Results of meta-analytic research showed that teacher practices have a more significant impact on student achievement than do school practices (Z. Barley et al., 2002), and the teacher, along with the teacher's instructional strategies, plays a larger role in student achievement when reviewing standardized test scores than

does the curriculum, textbook, or supplemental instructional program (Slavin et al., 2009).

When a student was in an ineffective school but with an effective teacher, Marzano (2003a) pointed out that the student had a 13 percentile increase in achievement. Haycock and Crawford (2008, p. 14) indicated that students taught by effective teachers can expect an annual 5 percentile point increase where students taught by ineffective teachers can lose 5 percentile points. Haycock and Crawford (2008) went on to indicate that the annual increase or decrease in student achievement is cumulative. Effective teachers can incorporate instructional strategies that help all students learn.

Differentiated instruction. Students differ from one another and so should their learning experiences and modes of demonstrating that learning (Gaddy et al., 2002). Differentiated instruction helps allow for differences in student learning (Huebner, 2010), thinking styles (Sternberg & Zhang, 2005), and learning pace (Tomlinson, 2005). Rather than using curriculum plans assigned for the course, Marzano (2003a) wrote that effective teachers "consider the needs of their students collectively and individually" (p. 4) and then determine the best method, pace, and approach for that content. Differentiated instruction allows students to demonstrate their learning through a variety of means (Tomlinson, 2001) and is an effective instructional strategy for low-SES students. Effective teachers can use differentiated instruction followed by checking for a student's understanding through informal question and answer assessments.

Formative assessments. McLeod (2005) noted that meta-analytic research showed effective formative assessments have a greater impact on improving student

achievement, including closing the achievement gap, than "any other instructional practice" (p. 4), supply updated information to allow for redirected instruction, and can serve as benchmarks for annual learning goals. In the classroom setting, McLeod asserted that, "data analysis should cause targeted instructional changes to improve student learning" (p. 5) and student data should be a part of continuous instructional improvement (Black & Wiliam, 2009; Hamilton et al., 2009; Huebner, 2009). Teachers should make instructional decisions based on data from their students' work accordingly (Lieberman & Miller, 2001), and formative assessments serve as guides for students' progress toward annual learning goals (Huebner, 2009; McLeod, 2005). Researchers found that effective formative assessment practices have shown to be powerful tools to improve student achievement and that formative assessments provide updated information to which the teacher could allow for redirected instruction that could benefit student learning (Huebner, 2009; McLeod, 2005; Popham, 2009b). Formative assessments can help develop the student-teacher interaction, student motivation, and student achievement (Brookhart et al., 2008; Wiliam, 2007) and can highlight student accomplishments (Tomlinson, 2007). Researchers showed frequent formative assessments revealed students' thinking (Bransford et al., 2000) and could provide a "realistic measurement of students' progress" (Dochy et al., 1999, p. 170). The initial content or unit lesson plan should allow for predesigned formative assessments (Black & Wiliam, 2009). As indicated in the March 2010 edition of the First Bell newsletter, the superintendent (Local County School District, 2010a) noted that teachers in Local County use informal benchmark information to design classroom instruction.

Reform

Reforms in and of themselves do not work; rather, teacher practitioners and schools need to take the appropriate actions that work (Le et al., 2009; Levin & Wiens, 2003; Payne, 2008; Slavin et al., 2009) and school systems need to ensure the best possible instruction is delivered to every child ("Characteristics of the world's high-performing school systems," 2008). Levin and Wiens (2003, p. 659) further noted that some large-scale reforms have not produced an increase in student achievement as promised because the reforms did not concentrate on specific changes that teachers implement, schools maintain, students accept, or parents support. Weissbourd (2009) noted that various reforms have been attempted for decades but rarely achieve the desired result of fundamentally changing students. Substantial research, best practices, targeted interventions, and a focus on student outcomes should shape education policy (Le et al., 2009; Levin & Wiens, 2003; Schleicher, 2009).

Research-based educational reform. Lefkowits and Woempner (2006) wrote that, "schools at risk of sanction need research-based, focused direction from school boards" (p. 7) and should focus only on a few foundational issues at a time. Educational reforms do not occur in a vacuum; research should inform educational decisions but not take the place of sound judgment (Henig, 2008). Le et al. (2009) recommended that, before initiating changes in instructional approaches, school districts should be mindful of the local learning context, teacher preparation, and local curriculum as these factors have a significant impact on student achievement. Slavin, Lake, and Groff (2009) warned that low-achieving, high-poverty schools should incorporate only proven

educational programs. While research-based teaching recommendations are not guarantees of success due to the particular circumstances of each setting, teachers can be assured that it is better to use practices that probably will succeed than those that probably will not (Payne, 2008; Popham, 2008). Parrett and Budge (2009) indicated that developing a data driven system with objective goals was a valuable element for making decisions and sustaining increases in student achievement. Levin and Wiens (2003) noted that large-scale education reform was a slow process, susceptible to political whims, required long-term commitment, and judged retrospectively (p. 663); reforms should primarily promote teaching, learning, and community involvement. When the needs of the school or community do not allow time for the slow process of educational reform to occur, a quicker method is possible.

Turn around schools. In some cases, schools need to review practices that will turn around a school in 1 to 2 years and not in an incremental fashion (Herman et al., 2008b). To transform low-performing schools quickly and dramatically, Herman et al. (2008b) recommended initiating specific research-based models that provide decisive steps for improvement but noted that research for specific strategies to turn schools around was limited; what strategies were effective may not apply to all settings. Herman et al. (2008a) recommend four connected strategies: "signal the need for dramatic change with strong leadership," "maintain a consistent focus on improving instruction," "make visible improvements early in the school turn around process (quick wins)," and "build a committed staff" (p. 9). In some cases, the school leaders' decisions directly influence the turn around and sustained student increases for a school (Parrett & Budge, 2009).

Low-performing, high-needs schools can transform into high-performing, high-needs schools.

High-performing, high-needs schools. There are fundamental differences between low-performing, high-needs schools and high-performing, high-needs schools (Mid-Continent Research for Education and Learning, 2005a). High-performing, high-needs schools, according to Lefkowits and Woempner (2006) and Mid-continent Research for Education and Learning (2005b), had a more supportive environment, teachers used effective and structured teaching strategies, and there was strong leadership. Lefkowits and Woempner (2006) noted four components of high-performing schools: strong leadership, professional community, school environment, and instruction. Leadership guided educational change, instruction, and provided common mission and goals; community allowed for collaboration, professional learning, and decisional input; environment provided for parental involvement, academic achievement, and orderly climate; and instruction allowed for differentiated learning, teacher feedback, and challenging learning opportunities (Lefkowits & Woempner, 2006). Adler and Fisher's (2001) research supported the idea that strong leadership, organiziational direction, professional development, teacher collaboration, and academic expectations contribute to high achievement in high-poverty schools, and other researchers showed orderly school environment, student ability to achieve, and leadership availability all contribute to a high-performing, suburban middle school (Brown et al., 2004). Other research findings suggested similar factors were a part of high-performing, high-needs schools: high academic student expectations, strong relationships between students and staff, focus on

student achievement, clear learning goals, fostering a safe environment, strong leadership, extended learning time, emphasizing literacy skills, and shared decision making (Hernandez, Kaplan, & Schwartz, 2006; Kenkel, Hoelscher, & West, 2006; Mid-continent Research for Education and Learning, 2005c; Parrett & Budge, 2009).

Learning-Focused Schools

Model. Thompson (2009i, 2009k) indicated that the development of LFS was in response to efforts to increase student achievement, reduce achievement gaps, and was founded on "research based strategies that impact achievement the most" (2007, 2009h; 2009k, para. 3) from the evaluation conducted by the U.S. Department of Education of 3,100 exemplary schools. Thompson (2009k) stated that, "Our learning framework rapidly and effectively raises student achievement" (para. 3) and indicated that LFS "has had a positive impact on student achievement on a national, state, and local school level, particularly for low-income, underachieving students" (2009a, p. 3). The LFS model, in its totality, involves lesson planning, curriculum development, student instruction, student assessment, and school-wide organization (Royer, 2009; M. Thompson, 2009i, 2009k).

The research-based strategies Thompson included were team planning, curriculum mapping, graphic organizers, in-context vocabulary, summarizing, and extended thinking; Thompson (2009k) indicated that LFS built on those strategies with reading comprehension, school-wide writing, accelerated learning, differentiation, and other strategies designed to increase student achievement. It is unclear exactly what research Thompson used to design the LFS model of instruction. Thompson (2009e)

stressed that LFS was a planning model to help teachers convert state standards into lessons and make connections between curriculum, planning, instruction, and assessment, but urged practitioners to implement the parts of LFS that align with local styles and goals and not implement the model blindly. Thompson (2009e) continued by noting that it was the teachers and administrators of a school who create increased student achievement and not LFS. Thompson (2009e) did provide a list of resources that provided the basis of LFS (2009h) and noted three independent studies have documented LFS increases student achievement, but did not provide specific references for those three studies (2009g); the studies LFS used to demonstrate increased student achievement is unknown. When asked about the other specific references to support the LFS claims, Altman (personal communication, August 3, 2009) indicated that the website gave the specific references for the LFS strategies notebook, but the other 45 LFS books are materials that have the additional references. Thompson (2009e) recognized that the instructional strategies incorporated into LFS are not new, but stressed that the implementation to and connections between those strategies are what make LFS unique. The LFS model, as a whole, reaches into all aspects of the school environment.

Breadth. According to the LFS website, the vision, commitment, and mission of LFS are to "[transform] all schools into exemplary schools… [provide] remarkable experiences and exceeding expectations… [and provide] practical and innovative solutions and products with an emphasis on advancing student learning, instructional practices, and leadership skills" (M. Thompson, 2009j, para. "Our principles"). Thompson's web site indicated LFS is the "#1 framework for thinking about, planning,

and delivering instruction" (2009c) and is the "most comprehensive model for connecting curriculum, instruction, and assessment" (2009c, para. "What is Learning-Focused?"). LFS did not develop from any other model of instruction but created the model from practices used in exemplary schools (M. Thompson, 2009e). The LFS organization indicated they provided, "professional development, resources, products, technology support, and friendly and knowledgeable consultants" (M. Thompson, 2009i, para. 1). In addition to creating awareness for school improvement in areas targeted by the LFS model, the LFS developers designed measures to help schools implement the model throughout the school.

Implementation. LFS created an implementation rubric to guide schools, and school districts, in determining the steps to take, areas to improve, and goal setting for implementing the LFS model of instruction (M. Thompson, 2009d). To receive full implementation, key areas of implementation should show 85% to 100% full compliance. Key areas included where stakeholders received LFS training in strategies and monitor implementation, aligned the curriculum with the state standards, developed curriculum maps, conveyed grade-level expectations, created curriculum units, used LFS for lesson planning, used essential questions and activating strategies, used LFS teaching strategies and writing across the curriculum, used formative assessments, analyzed data, and participated in collaborative planning (M. Thompson, 2009d). Scores from a LFS rubric could reveal not only the level of implementation but also areas for improvement.

Irrespective of the program used, model of instruction implemented, or level of training for teachers, there could be significant variability of implementation with

instructional strategies between teachers within each school (Le et al., 2009). It is possible that, even with significant training and continued instruction support, teachers do not, or are not able to, implement the educational reform of LFS in its entirety (Le et al., 2009; Royer, 2009). The LFS rubric allows between 85% and 100% compliance in many categories and still receive full points. In a small middle school, 10 teachers could not implement LFS and the school could still achieve full compliance. If a student had four academic teachers and two nonacademic teachers, then it is possible that the student could be in a fully compliant LFS school without ever being in a class where the teacher used the LFS model of instruction.

Implementing LFS could be costly. Reports indicated that LFS implementation could cost school districts between $3.7 million (Blair, 2007) to $4.5 million (Solochek, 2007). According to LFS (M. Thompson, 2009f), there are 10 schools which have implemented LFS in an exemplary way. Exemplary LFS schools were chosen because all of the teachers used three or four strategies all of the time (M. Thompson, 2009e). Thompson (2009e) indicated that when schools use strategies consistently and pervasively, students learn and retain more. Thompson's data was not available for review.

Not all teachers or school district personnel accept the LFS model, strategies, or methods. Teachers have responded anywhere between reluctance of implementing the new model to filing formal grievances (Solochek, 2007). Solocheck (2007) recorded that school district board members acknowledged issues, problems, and concerns with the LFS plan in their particular district, but felt that there was so much excitement about the

program, the issues would eventually be resolved. This rationale goes against sound educational policy—substantial research, best practices, and student outcomes should shape educational policy (Le et al., 2009; Levin & Wiens, 2003). Before implementing new district-wide models of instruction for all students, policy makers and teachers wanted to know that the LFS model of instruction was research-based and that there was evidence the LFS model worked as Thompson claimed.

Research. Thompson (2009g) indicated Robert Marzano and the Mid-continent Research for Education and Learning organization, among others, provided research for the basis of LFS. Thompson's (2009g) research tables from the LFS website were strikingly similar, but importantly different from (a) Figure 9.2 on page 80 in Marzano's (2003c) What Works in Schools, (b) Table 1.1 on page 4 of Marzano, Gaddy, and Dean's (2000b) meta-analysis report, and (c) Figure 1.3 on page 7 of Marzano, Pickering, and Pollock's (2001) book. Marzano and his colleagues (Marzano, 2003c; Marzano et al., 2000b; Marzano, Pickering, et al., 2001) specifically stated in all manuscripts that the results of their meta-analysis identified "identifying similarities and differences" as having an average effect size of 1.61 with a percentile gain of 45 and "summarizing and note taking" as having an average effect size of 1.00 with a percentile gain of 34 (Marzano, 2003c, p. 80). While Thompson (2009g) recorded the statistical data for these first two categories exactly to support his research base, he did not retain the precise category descriptions; apparently, Thompson altered the research categories but kept the same effect sizes. Marzano and his colleagues noted that specifically identifying similarities and differences (not extended thinking as Thompson indicated) included

student work that specifically involved comparing, contrasting, metaphors, and analogies. Further, Marzano and his colleagues specifically identified summarizing and note taking as student work that specifically created verbal or written summaries, in-class notes, and adjusted, corrected, or appended notes (Marzano, 2003c). Thompson (2009g) shortened the category to summarizing only. It appears that Thompson supported this abbreviated categorization with intact effect sizes as participants in his workshops and teachers who use his model believed that extended thinking increased students' achievement by 45% and summarizing (only) was the "number two strategy for increasing student achievement" (Phillips, 2009a, para. 4).

LFS studies. Thompson's (2009g) data from a study conducted with 57 schools from 4 districts in 3 states indicated that the average 2-year gain in reading for all students increased 18.4%, students with disabilities increased 28.7%, and economically disadvantages students increased 16.8% (2009g, Study 1). For math, Thompson recorded 2-year gains for all students as 23.8%, students with disabilities as 28.8%, and economically disadvantaged students as 24.0% (2009g, Study 1). Thompson does not give a reference of the study so that the data could be verified.

In a second study, Thompson (2009g, Study 2) noted that the increase in students' scores from 283 middle school teachers in grades 6 through 8 showed an approximate increase of 22% in reading and approximately 19% in math (see Table 2). Thompson's (2009g, Study 3) data for an individual school showed significant increases in student achievement. Thompson's third study showed a 1-year increase for all students of 6% and 5% in reading and math respectively, 14% and 10.7% increases for SWD in reading

and math, and 7% and 3% in reading and math for economically disadvantaged students (2009g, Study 3).

LFS effective for 90/90/90 schools. Blair (2007) reported that the Education Evaluation Consortium, which is affiliated with Max Thompson, collected data from schools that were culturally diverse but had 90% or more students at or above grade level, 90% free or reduced lunch, and 90% students from minority groups (90/90/90 schools); approximately 4,200 schools fit this criteria (Solochek, 2007). Thompson and the Consortium looked for instructional methods that could serve as a model for other schools and concluded that exemplary schools began each lesson with a question (Blair, 2007; Solochek, 2007). Solochek (2007) reported Thompson indicated that if the teaching methods that worked well in the 90/90/90 schools, those methods could work anywhere; other researcher findings would tend to support that claim (Slavin et al., 2009). To ensure teachers incorporated essential questions and structured their lessons appropriately, schools would need to allow teachers adequate planning time.

LFS planning. Blair (2007) recorded that a superintendent was enthusiastic about LFS as a way to increase learning for all students because LFS emphasized learning and not teaching, but noted the superintendent's concerns that LFS required more planning, previewing of material, essential questions, student summarization, sometimes a physical reorientation of the classroom, and was blamed for decreased teacher morale. LFS may take more time for effective planning (Phillips, 2009c; M. Thompson, 2009e), but Thompson suggested that principals needed to provide for

school-wide collaborative planning, rotating substitute teachers to allow for teacher team planning, after school planning, or even planning during the summer break.

Activating students' prior knowledge. LFS incorporated some strategies that activate students' prior knowledge, but activating prior knowledge in LFS is not explicitly required. In the LFS notebook, 15 of the 236 pages mention activating students' prior knowledge (M. Thompson & Thomason, 2002). Marzano, Norford et al. (2001) pointed out that asking questions, even before a learning assignment, could be an effective tool to access students' prior knowledge. Rockwell (2007) pointed out that one way to assist students in activating their prior knowledge was by having the students write what they knew and would like to know about a topic. LFS uses a system to detail what students know, what they want to know, and what they learned (KWL). Marzano, Norford et al. (2001) indicated that the KWL strategy was an effective, direct approach for using explicit cues. Rockwell (2007) also pointed out, and other researchers support, that cues and questions, graphic organizers, and word banks are useful in activating students' prior knowledge or for review (Bransford, Brown, & Cocking, 1999; Cargill, 2009; Division of Instruction, 1990; Donovan et al., 1999; Gaddy et al., 2002; Marzano, Norford, et al., 2001; Phillips, 2009b; Solochek, 2007; M. Thompson, 2009k; A. W. Wright & Bilica, 2007).

While a key component of LFS is the activation of student thinking (M. Thompson, 2009e), activating students' prior knowledge is not explicitly required. Activating thinking (for the upcoming current lesson) is not the same as activating a student's prior knowledge (from prior lessons). Boyles (2009a) indicated that the LFS

method of activating students' thinking was primarily an instructional strategy to capture students' attention for engagement in the class to help decrease inappropriate behaviors (classroom and behavior management). Kruse (2010) indicated that asking a thought-provoking question or presenting an interesting fact could gain students' attention and stimulate students' curiosity, motivating students to learn. Marzano, Norford et al. (2001) cautioned that merely gaining students' attention might also distract students from "focusing on what is important" (p. 269) in regard to the learning goal. In Phillips' (2009b) Ten Commandments of Learning-Focused, there is no mention of activating students' prior knowledge. In the resources section of the LFS web site, there were 104 articles on instruction but only three discussed activating students' prior knowledge (M. Thompson, 2009b).

Results. Thompson (2007) promoted the LFS materials with data such as, "Research [on schools using LFS] shows an average student achievement gain of 20% each year from the previous year's state test scores" (p. 15). Thompson (2009a) indicated that LFS rapidly and effectively increased student achievement particularly for low-income and under-achieving students. Alternatively, it may be that the teachers in those under-performing schools, in Thompson's data, simply did not have a good lesson plan design.

> Maybe the reason the low-SES schools increased student achievement was due to their teachers not teaching very well; maybe they didn't have a good lesson plan design. Learning-Focused provided a lesson plan format for teachers to follow and a specific plan on how to teach. If those teachers had been using an effective

> lesson plan design the whole time, then LFS would not have produced the same results. LFS did not turn those schools around, making the teachers teach turned those schools around. (E. C., personal communication, August 2, 2009)

The LFS statistics promoted by Thomson (2007, 2009a) indicated that students in the sixth through eighth-grade had a noncumulative 3-year increase in their reading scores by 17%, 18%, and 23% and similar increases in math of 21%, 22%, 24% (see Table 2). Over an 8-year period at Tiger Middle School, the

- sixth-grade students' reading scores changed 8 points but math scores remained unchanged,
- seventh-grade students' reading scores changed -6 points but the math scores changed 4 points, and
- eighth-grade students' reading scores changed -17 points but math scores changed 7 points.

The overall net effect of using LFS for an 8-year period was a student achievement change of -4 points on standardized test scores (see Table 1). Tiger Middle School has not seen the dramatic increases in student achievement as reported by LFS. It is not clear that the LFS company has appropriately used past research, positions of authority, or previously copyrighted material.

Unclear interests. There have been several reports suggesting conflicts of interests regarding Thompson and the LFS company. Thompson (2009g) noted that research conducted by the Educational Evaluation Consortium provided data to develop the overall concept of his model. The Educational Evaluation Consortium was not an

independent or third party contractor, but was a company with which Thompson was affiliated (Blair, 2007). Newsom (2000) reported that after requesting specific payment documents, Thompson resigned as a senior administrator in the school system; Thompson cited a conflict of interest between his senior administrator position and his connection with his company that created, produced, and distributed the LFS materials. According to Newsom (2000), Thompson was not aware of the state's conflict of interest law that forbids a school employee from selling materials to the school system while employed there. Thompson went on to say that he was unaware that some of the material in the writing guides had been previously copyrighted and previously published (Newsom, 2000).

Search Terms and Efforts to Find Research.

The goal of the database searches was to find literature related to teaching methods, styles, models, and skills; academic achievement; low income and high achievement; cognitive processes or reasoning; prior learning; educational psychology and learning; low-SES influences; teacher-level effect; conditions for learning; and the Learning-Focused Schools model of instruction, Max Thompson, and the Education Evaluation Consortium. The database searches, excluding references regarding LFS, included Education Research Complete, Education Resource Information Center (ERIC), PsycARTICLES, Academic Search Premier, PsycINFO, Teacher Reference Center, PsycBOOKS, Chronicle of Higher Education, eLibrary, eReference Encyclopedias, SAGE Journals Online, and SocINDEX.

The results for educational psychology and learning (not review) contained over 18,000 matches; the matches for educational psychology and theory were almost 7,000. The full-text search "high achiev* and low" with a limitation of publications since January 1, 2003, resulted in 413 matches. The full-text search for "low income and high achieving" returned 66 matches. Full-text searches for publications containing "prior learning" since 1990 returned 1,152 matches. Full-text searches for publications containing "teaching models" or "teaching skills" or "teaching styles" since 2002 returned 1,195 results.

Searches for literature related to LFS were conducted in scholarly databases. The search terms included: "learning focused and Thompson," "LFS and Thompson" "learning concepts and Thompson" "Learning and Max Thompson," "Max Thompson," "Performance Assessment Center," "Education and Evaluation and Consortium," "Education evaluation consortium," "Education evaluation consortium and Max Thompson," "Learning focused schools" (description field), "Max Thompson" (subject or description field), "Learning focused schools and Thompson," "learning and focused and schools and Thompson," and "learning-focused." For the Internet searches, the terms included "learning focused schools Max Thompson," "learning focused schools," "Max Thompson," "LFS," "LFS Max Thompson," "Max Thomson Learning," "learning-focused schools," and "learning-focused schools Thompson."

Using 13 search terms, identified through the research literature in various keyword combinations with all dates inclusive, searches were performed in the following databases: Academic Search Premier, Chronicle of Higher Education, Dissertation and

Thesis full text, eLibrary, Education Research Complete, eReference Encyclopedias, Education Resource Information Center (ERIC), ProQuest Newsstand, SAGE Journals Online, and the Teacher Reference Center. Additional Internet searches included Google Scholar and Institute of Educational Sciences (U.S. Department of Education), products, all centers. The searches produced 100 results. Of those 100 results, 41 were relevant to this study, and 59 were irrelevant. Of the 41 results relevant to this study, 24 were essays, 3 were newspaper articles, 2 were Internet web log discussion posts, 1 was a project description, and 11 were of a scholarly nature. Of the 11 relevant results, only 4 were not duplicates from other results. Of the four relevant results, three were dissertations and one was an interview article from a journal. The interview from the journal article was from 2004, one dissertation published in 2006, and the other two dissertations published in 2009.

Relevant Public Data

Public-access data that are relevant to this study are located on the Internet. CRCT mean scores and AYP data are located on the Georgia Department of Education web site (http://www.gadoe.org). Local school system information is located on the local school district web site. Local Tiger Middle School information is located on the middle school web site. Information regarding the LFS model of instruction is located on the Learning-Focused Schools web site (http://www.learningfocused.com).

Implications

Significance

A study such as this will be significant for several reasons. First, this study will add to the scholarly research by investigating the relationship between known student-level conditions for learning (i.e., prior knowledge) and known effective teacher-level techniques for instruction (e.g., cues and questions) on student achievement as identified by multiple researchers and studies (American Psychological Association, 2008; Bransford et al., 1986; Dochy et al., 1999; Donovan et al., 1999; Marzano, 2003c; Marzano et al., 2000b; Pacchiano, 2000). Second, this study will contribute to the literature in the field by investigating a known instructional strategy gap of activating students' prior learning using cues and questions for teaching students in low-SES schools as suggested by previous researchers (Z. Barley et al., 2002; Dochy et al., 1999; Gaddy et al., 2002; Marzano, 1998, 2003c; Marzano et al., 2000b; Sirin, 2005; Wyner et al., 2008). The results of this study may provide data where policy makers could institute a policy of activating prior knowledge with cues and questions before proceeding with the main learning goal(s) so that classroom practitioners could be highly effective.

Implications for the project study could reveal if using LFS alone without specifically activating students' prior knowledge is meeting the educational needs of the low-SES student population at Tiger Middle School. Results could suggest if LFS includes appropriate models of activating prior knowledge when introducing the main learning goal(s) of the lesson for low-SES students. Implications could suggest instructional adjustments for the LFS model of instruction.

Importance

This ex post facto project study will be valuable to four groups as they relate to low-SES schools using the LFS model of instruction: teachers, administrators, policy makers, and researchers. Interested classroom teachers will include teachers for regular, remedial, and advanced students who may be seeking the best instructional strategies for teaching and increasing their students' achievement. Interested administrators will include instructional lead teachers, curriculum coaches, administrators in charge of instruction, and principals in low-SES schools where consistently increasing student achievement is critical. Interested policy makers will include persons responsible for the instructional effectiveness of classroom practitioners and persons responsible for monitoring standardized tests scores where annual improvement is required. Interested researchers will include persons investigating low-SES schools, effective teaching techniques, students in low-SES schools, the LFS model of instruction, the construction of knowledge, and the role of prior knowledge in learning.

Implications for Possible Project Directions

As achieving annual increases in students' test scores and succeeding in having 100% of students meet the minimum state standards by the 2014 NCLB deadline confronts more schools, it will be necessary for teachers to use the most effective instructional strategies for their classrooms—particularly for low-SES students. If the LFS model of instruction continues to be implemented by schools looking to increase student achievement, it will be critical to review if activating students' prior knowledge before using LFS increases the effectiveness of the LFS model of instruction. A white

paper to the local Board of Education and school administrators would be an appropriate means to relay data on the results of this study or on the LFS model as implemented in the schools. Additional means to relay results and recommendations to the local school stakeholders would be through visual and aural presentations, distributable electronic and hard copy materials, staff assemblies, professional development sessions, and an adjusted lesson plan format.

I anticipated the results of the project study would reveal a difference in student groups whose prior knowledge was activated and those whose were not. I anticipated the local school district correctly implemented the LFS model of instruction, but the current design of LFS was incomplete with specifically activating prior knowledge. I anticipated that the implementation and format of EATS was overly simplistic—for any model of instruction—and did not activate students' prior knowledge to maximize student learning or increase student achievement results consistently. Regarding design, I anticipated activating students' prior knowledge was not prevalent or explicit enough in LFS for a low-SES school, but that LFS did contain some effective instructional strategies.

Social Change

Local social change implications include providing school- and district-level administrators information and data on the effectiveness of activating students' prior knowledge before using LFS in a low-SES middle school. As the state-mandated curriculum is broad and substantial, teachers need to use the most effective instructional strategies to cover, and not neglect, the content (Le et al., 2009). The findings could provide data for teaching strategies and the LFS model of instruction that may affect local

and district instructional decisions. As a result, administrators may decide to keep, modify, or improve the current lesson plan design and presentation as suggested by the LFS model of instruction. This project study could be disseminated and initiate social change by providing school districts across the state or nation information on the effect of activating students' prior knowledge before using LFS so that research-based instructional decisions could be made in regard to implementing LFS.

Additionally, if Tiger Middle School implemented LFS correctly and did not reached the levels of student achievement success as suggested by LFS (M. Thompson, 2007), it is possible that other schools using LFS in the larger educational context are not reaching their increased student achievement goals as determined by AYP either (Herman et al., 2008a; Nichols & Berliner, 2008). Effective teaching should increase student achievement (Scherer, 2008). Boyles (2009b) commented that when schools implemented effective teaching strategies, like activating prior knowledge, primarily to increase the student achievement of struggling students, the strategies benefited all students.

Summary

For low-SES schools to demonstrate and sustain annual increases in student achievement as determined by standardized test scores, teachers need to use the most effective instructional strategies in their classrooms on a consistent basis. Low-SES environments could negatively affect student achievement by limiting a student's prior knowledge. As many low-SES students come to school with less prior knowledge, teachers may offset that reduced knowledge by explicitly activating a student's prior

knowledge before using LFS to present the main learning goal. Teachers could use a model of instruction that activates students' prior knowledge; links the new content to students' prior knowledge; then develops, organizes, and presents the new content in a manner to which students can relate and remember. Due to the effect of low-SES situations on students, teachers in low-SES schools need to use the most effective teaching methods to increase student achievement.

The study relates to past literature by continuing research in the importance of a student's prior knowledge, teacher's instructional strategies, activating prior knowledge, the overall teacher effect, lesson design, and the student-achievement effect from low-SES environments. The study will relate to and extend the current research by evaluating the student achievement outcomes resulting from a low-SES middle school using a specific model of instruction, LFS, by trained staff for a period of 8 years and activating prior knowledge before using the LFS model of instruction. Social change implications may include recommendations for instructional strategies for low-SES middle schools, cautions for schools that implement new models of instruction, recommendations for schools currently using LFS, adjusted lesson plan and delivery formats (see Appendix A), and considerations for schools reviewing LFS to increase student achievement.

Substantial research, best practices, and student outcomes should shape education policy (Le et al., 2009; Levin & Wiens, 2003). To that end, a project study was conducted to determine if activating students' prior knowledge before using the LFS model of instruction increased student achievement. Section 2 will present the project study methodology, the data analysis results, and findings directly related to the research

questions. Section 3 will present the project design, and section 4 will present other findings, conclusions, and recommendations.

Section 2: The Methodology

Research Design and Approach

After receiving the Institutional Review Board's approval (#09-01-10-0386525), an ex post facto study was used to compare the achievement of low-SES, middle-school students at Tiger Middle School, enrollment 682, from archival data that represented student records from pre and posttest assessments that were teacher created by grade level and class. Following normal procedures and curriculum, teachers had earlier prepared subject and grade-level appropriate pretests, lessons, and posttest aligned with the Georgia Performance Standards curriculum. Samples of the assessments are included in Appendix B. The archival data represented two types of classes: where teachers activated students' prior knowledge before using LFS and where teachers taught using the LFS model of instruction only. Records indicated that seven teachers activated students' prior knowledge before using LFS and six teachers used the LFS model of instruction only. An ANCOVA analyzed the archival data.

Justification

To answer the research question, the records representing the teacher, class period, if the teacher activated prior knowledge or not for that class, and the teacher-created pre and posttest assessments were reviewed to identify variables for analysis. The records reflecting if the teacher activated students' prior knowledge before using LFS became the independent variable. The records reflecting the students' posttest results were the dependent variable. The records reflecting the students' pretest assessment by class and grade level served as control variables.

To prepare the records reflecting the students' scores for analysis, the data representing the pre and posttest assessment results had to be standardized because the teachers did not give the same pre or posttest assessments across each grade level or subject matter. The standardization for the data representing the students' pretest scores was conducted using the following formula: (student's original pretest score – mean of the original pretest scores) / standard deviation of the original pretest scores. The standardization for data representing the posttest scores followed a similar formula. The standardized data representing the posttest scores became the dependent variable, and the standardized data representing the pretest scores, along with the grade level, became controlling variables, or covariates, for the ANCOVA.

In order to test the effect of activating students' prior knowledge on student achievement, an ANCOVA was conducted. Using the archival data, the ANCOVA measured the effect of activating students' prior knowledge before using the LFS model of instruction (independent variable) by analyzing the standardized data representing the posttest assessment results (dependent variable) while controlling for the grade level and the standardized data representing the students' pretest assessment results (control variables). An ANCOVA was an appropriate statistical analysis because it measured the difference between population means while reducing the effects caused by the differences between the populations before the study started that may have influenced the dependent variable (Huitema, 2006). By accounting for, or controlling, the influence of the covariates through an adjusted mean, an ANCOVA generates a more reliable statistical

result by providing a smaller error term ("Analysis of covariance", 2010; University of Wisconsin, ND).

Rationale for Design

The design for this study was an ex post facto, or causal, project study using an ANCOVA to analyze archival data representing students' pre and posttest assessment data from multiple grade levels and subject matters to determine if there was an effect of activating students' prior knowledge on student achievement (Creswell, 2003). The design addressed fundamental student achievement issues at Tiger Middle School while incorporating available archival data. The design allows for, and controls, grade level and class covariates that could not be prevented or eliminated.

Explanation

The local school district began using LFS in the 2002/2003 school year. According to Thompson (2007, 2009a), LFS was designed to increase student achievement, particularly for at risk and low-SES students similar to the students at Tiger Middle School. LFS material suggested that student achievement would increase approximately 20% each year (Cason, 2007; M. Thompson, 2007). Even after prolonged use of LFS, the students at Tiger Middle School have not demonstrated consistent increases in student achievement or ever demonstrated 20% yearly increases in student achievement. As depicted in Table 1, two of the six scores (33%) have actually decreased after using LFS for 8 years. The design of this study was to investigate if activating prior knowledge before using LFS was more effective in student achievement than using the LFS model of instruction alone.

Setting and Sample

Population

In 2010, there were 682 sixth, seventh, and eighth-grade students enrolled at Tiger Middle School, a low-SES middle school in a Title I school district in northwest Georgia. The archival records representing the teachers, classes, and students' pre and posttest assessments indicated that 11 teachers entered information this study could use. Each teacher's maximum number of students for the day was between 60 and 112, but seven of the teachers activated students' prior knowledge. By virtue of grade-level teacher grouping, seven teachers could have taught some of the same students. As the students from the seven teachers would have additional sets of data, the number of students for those teachers was multiplied by the number of teachers in that group (either 2 or 3) creating a maximum student records population of 2,069. This overlap of student data created 1,047 usable records representing students from 45 class periods. The data used for this study were the students' records.

Sampling Method and Sample Size

The sampling method was to analyze only the actual number of records representing the students' pre and posttest assessment results input by the 11 teachers. The sample size of the population was 1,047 records. According to the Raosoft (2004) and Creative Research Systems (2010) sample size calculators, an approximate sample of 329 records would suffice to achieve a 95% confidence level for a population of 2,069. The resulting sample size was more than enough to satisfy the confidence level.

Eligibility Criteria

The criteria for selecting the records from the classes included that the certified teachers taught in their respective subject matters and grade levels and were considered highly qualified according to NCLB guidelines. Additionally, each teacher had to have a minimum of 3 years teaching experience and taught by activating students' prior knowledge or by using LFS only. The eligibility for the records representing the students' scores was that the students participated in a pre and posttest assessment and were under the instruction of a teacher that taught by activating students' prior knowledge or by using LFS only.

Characteristics of Selected Data Sample

The records indicated the characteristics of the data sample were pre and posttest assessment scores from sixth, seventh, and eighth-grade middle school students at Tiger Middle School. The students' assessment records represented a broad spectrum of core academic and Connections classes, subject matters, and grade levels. Teachers' classroom experience ranged from 5 to 29 years, and students' ages ranged from 11 to 14 years.

Instrumentation and Materials

Instrument and Materials

The teachers had previously developed, administered, and scored a grade-level and subject-appropriate pretest assessment. Teachers planned and provided instruction according to the Georgia Performance Standards curriculum and then administered and

scored a posttest assessment to measure student achievement. Samples of the assessments are located in Appendix B.

Variables

The independent variable was the teaching strategy of activating students' prior knowledge with cues and questions before using the LFS model of instruction to present the main learning goal. The dependent variable was the records reflecting the students' posttest assessment score. The controlling variables were records reflecting the students' grade level and pretest assessment score by class.

Concepts Measured by the Instrument

Following the Georgia Performance Standards schedule and curriculum, the teachers determined the instructional concepts to be covered and prepared learning units lasting between 3 and 6 weeks. The concepts covered were appropriate for each grade level and subject matter according to the Georgia Performance Standards. The pre and posttest assessments reflected the Georgia Performance Standards concepts taught during that learning unit.

How Scores Were Calculated and Their Meaning

The teachers determined the grading scale for the pre and posttest assessments according to the grade level and subject matter. The records indicated that the score range was between 0 and 100 points. Students scoring 90 or above were given an A, 80-89 a B, 70-79 a C, and below 70 an F.

Reliability and Validity

The teachers did not use standardized assessments that generated the records representing the students' pre and posttest assessment scores. Teachers prepared and administered their own assessments to measure students' understanding of the curriculum and gauge student achievement. As a result of the individual assessments used to generate the data, the individual teachers' tests cannot be considered valid or reliable.

Data Location and Availability

All data representing the students' pre and posttest assessment results are located in a lockable file cabinet in the researcher's home and are available upon request. The data consists of the students' CRCT scores recorded on Microsoft Excel spreadsheets on compact disks. Additional data consists of printed reports showing the students' pre and posttest assessment results.

Explanation of Data Used

The archived records included categories for teacher, class period, activating prior knowledge, student, pretest assessment score, posttest assessment score, and grade level. To measure each variable of the study, each teacher was given a numeric designation from 1 to 11, in no particular sort order, and each teacher's class period was given a numeric designation from 1 to 6, in no particular sort order, based on the number of classes the teacher had. Each student's class period was designated with a 6, 7, or 8 depending on the students' grade level. Teachers who activated students' prior knowledge before using LFS were designated with a 0, and teachers who used LFS only were designated with a 1. The records representing the pretest assessments scores were

standardized with the formula (student's original pretest score – mean of the original pretest scores) / standard deviation of the original pretest scores. The standardization of the posttest assessment scores were calculated in a similar manner.

The records representing whether the teacher activated students' prior knowledge or not before using LFS was used for the independent variable, and the records representing the standardized students' posttest assessment scores measuring achievement were used for the dependent variable. The records representing the standardized students' pretest assessment scores by class and the students' grade level were used as the controlling variables.

Data Collection and Analysis

I collected the data from the individual teachers. The data were needed on or before November 30, 2010 but were accepted until December 6, 2010. There were no costs to collect the data. The teachers' data source was Infinite Campus, a secured Internet grade book capable of storing student identification numbers, teachers' classes and grade levels, and assessment scores. The teachers had previously stored their pre and posttest assessment scores for each student in Infinite Campus.

Data Collection Process

Teachers created a grade report from Infinite Campus that contained the teachers' name, class period, grade level, student's identification number, and the students' pre and posttest assessment results. Teachers created the report as a printed hard copy, an electronic Adobe document, or an electronic Microsoft Excel spreadsheet; the teachers sorted the information ascending by the students' identification number. I copied the

electronic versions onto a read-write compact digital data disk using a school computer and transported the hard copies and the compact disks home via a lockable book bag.

The data were reviewed to make sure no student identifiable information was included. The data were sorted ascending by teachers' class period as indicated on the hard copies or electronic files. Each student in every class was given a number beginning with 1 in ascending order until all students in the class were designated numerically. Using SPSS, a data file was created which contained the following variables: teacher, grade, class, APK, pretest, posttest, change, standardized pretest, and standardized posttest. The data from the reports and files were input into SPSS for analysis and saved as *Data Set*.

Scale of Each Variable

The independent variable, records representing if teachers activated students' prior knowledge before using LFS or used LFS only, was a nominal scale. The nominal scale was appropriate because the independent variable had two categories (yes, no) that needed labeling, but were not quantitatively distinctive. The dependent variable, the records representing the students' posttest assessment scores, was a ratio scale. The ratio scale was appropriate because it was possible that students could score an absolute value of 0 on the assessment.

The records representing the students' pretest assessment scores by class used as a controlling variable were a ratio scale. The ratio scale was appropriate because it was possible that students could score an absolute value of 0 on the assessment. The records representing the grade level of each student (6, 7, or 8) used as a controlling variable

were an ordinal scale. The ordinal scale was appropriate because the grade-level categories were in an order indicating a directional sequence (Gravetter & Wallnau, 2008).

Hypothesis Statements

The research question and the null and alternative hypothesis statements for this study are:

- (RQ) Is there an effect on student achievement in low-SES middle schools when teachers specifically activate students' prior knowledge with cues and questions before using the LFS model of instruction?
- (H_0) There is no significant effect when teachers specifically activate prior knowledge with cues and questions before using the Learning-Focused Schools model of instruction on student achievement in a low-SES middle school.
- (H_A) There is a significant effect when teachers specifically activate prior knowledge with cues and questions before using the Learning-Focused Schools model of instruction on student achievement in a low-SES middle school.

Data Analysis

Regarding the research question, Is there an effect on student achievement in low-SES middle schools when teachers specifically activated students' prior knowledge with cues and questions before using the LFS model of instruction?, the data were analyzed using an ANCOVA. As seen in Table 3, students in the classes where teachers activated

students' prior knowledge had a statistically significant greater increase in achievement, controlling for the pretest and grade-level effect, as indicated in their standardized posttest scores, $F(1, 863) = 35.398$, $p < .000$, than the students whose teachers did not activate students' prior knowledge but taught using LFS only. For the research question, the number of data for the ANCOVA generated *df* of 1 and 863. The critical region for the *F* ratio in the ANCOVA was 3.86. The alpha level was set at a 95% confidence level, $\alpha = 0.05$.

The results of the ANCOVA indicated that the null hypothesis can be rejected and it can be concluded that activating students' prior knowledge with cues and questions before using the LFS model of instruction did create a statistically significant increase in student achievement compared to students whose prior knowledge was not activated.

Table 3

ANCOVA Results for Activating Prior Knowledge

	Sum of Squares	*df*	Mean Square	*F*	Sig.
Contrast	25.746	1	25.746	35.398	.000
Error	627.681	863	.727		

These findings support and confirm researchers' conclusions that (a) there is a relationship between activating a student's prior knowledge and increasing student achievement for low-SES students (Z. Barley et al., 2002; Gaddy et al., 2002; Marzano, 1998) and (b) teachers should plan for and explicitly activate a student's prior knowledge

and relate new learning to prior knowledge to increase student achievement (Pacchiano, 2000; Pacetti, 2004; Taylor et al., 2007).

Assumptions, Limitations, Scope, and Delimitations

Assumptions

Facts assumed true but are not immediately verifiable are:

- Before beginning service, new teachers to the local school district were fully trained in the LFS model of instruction.
- Teachers in the local school district were aware of the suggestions and requirements of the LFS model of instruction and regularly used several of the instructional strategies suggested by LFS.
- The increase in student achievement data provided by Thompson was unbiased, unaltered, and an accurate reflection of impartial research.
- The teachers each used the same posttest as they did for the pretest.
- The teachers accurately graded the assessment and recorded those grades in the online grade book.
- The students carefully and knowingly marked their answers to the pre and posttest assessments.
- The teachers' pre and posttest assessments were an accurate reflection of the curriculum content and material covered for that particular unit.

Limitations

The limitations, scope, and delimitations for this study included a focus on a specific instructional strategy in a low-SES middle school in a Title I school district in

northwest Georgia. A limitation in this study was that not all teaches used the same pre and posttest assessments. The pre and posttest assessment data are not equivalent in terms of instrumentation across the groups and were standardized for ANCOVA analysis. The study may not apply to all middle schools, Title I school districts, all students in Georgia, or schools that use the LFS model of instruction.

Scope

While Marzano, Gaddy, and Dean's (2000a) previous meta-analytic research has identified instructional strategies that were "for all students in all subject areas at all grade levels" (p. 4), the confined scope of this study was using archived records that measured a student's increase in achievement and understanding of curriculum as determined by a posttest assessment. Further variables confined the scope of this study to the effect of activating prior knowledge before using LFS, a student's grade level (6, 7, or 8), and students' pretest assessment scores by class period. The study is limited in generalizations to other instructional technique applications outside the scope of the study.

Delimitations

Delimitations were that this was an ex post facto project study using archival records. The records represented the students' pre and posttest assessment results that measured student achievement. The records also represented teachers who taught by activating students' prior knowledge using cues and questions before using LFS and teachers who taught using LFS only. The records also provided data that represented a student's individual grade level at Tiger Middle School.

Confidentiality

The records representing the data identified students randomly and numerically for the pre and posttest assessments scores. There was no contact between the researcher and the individual students regarding the study. I did not have access to any student identifiable information. There was minimal risk to breaches of student rights, privacy, confidentiality, or harm.

Conclusion

Section 3 includes information as to the description, goals, and rationale for the project design. Information is presented showing search terms and efforts to find literature as well as a review of the literature. The project is presented in detail including a plan for implementation and evaluation. Section 3 concludes with local and large-scale applications, implications for social change, and other conclusions.

Section 3: The Project

Introduction

This section presents a description of the project, specific goals for the project, and the rationale supporting the project's design. Search terms, searched databases, and search results are detailed as well as other efforts to find current literature related to the project and closely associated themes. This section presents a review of the literature as it related to the search results, the project, and the current state of efforts to improve student achievement. Included in this section are a discussion of the project, plans for implementing the project, plans for evaluating the project, and the implications for social change.

Description and Goals for the Project

The project is an adaptable sequence of statements and questions for the introduction and presentation of an instructional lesson. The sequence includes key components of a well-designed lesson plan as supported by learning theory, current research, and specific suggestions to activate students' prior knowledge before proceeding with LFS and the main learning goal. The lesson plan design is effective for increasing student achievement for students in a low-SES school compared to only using the LFS model of instruction as presented in section 2 of this study. The lesson plan design is adaptable for all schools and school districts. The sequence is adaptable to all standards-based, instructional lessons for all subjects, all grade levels, including core academic subjects and elective subjects. The lesson plan structure encourages teachers to use known effective instructional strategies that affect student achievement such as

identifying similarities and differences, using formative assessments to guide instruction, and identifying relationships between prior and new content.

The goals of the lesson plan design project are to

- Provide a lesson plan design that activates students' prior knowledge,
- Provide teachers a comprehensive, adaptable, easy-to-use sequence to introduce the lesson for the day, link the lesson to the curriculum standards, describe the main learning goals, activate students' prior knowledge, set forth learning expectations, and describe the main learning activities,
- Provide teachers a lesson plan structure that utilizes nine research-based, instructional strategy components that have proven effective, and
- Encourage teacher efficacy through the regular use of effective instructional strategies and specific strategies for teaching in a low-SES school (Goodwin, 2010b).

As researchers have noted, providing great teaching in all classrooms for all students "is not only possible, but within our reach" (Mid-continent Research for Education and Learning, 2010, inside front cover). This lesson plan sequence provides the means for teachers to prepare effective learning sessions, use proven methods to link new content to prior knowledge, incorporate effective instructional strategies into the lesson, and complement the required LFS model of instructional design. The lesson plan sequence should aid teachers in creating a constructivist learning environment, increase overall teacher effectiveness, and help offset low-SES effects found in the local school and school district.

Rationale

The teacher is the most influential element in the classroom that affects and increases student achievement. With one third of the schools in the nation failing AYP in 2009 (Usher, 2010) and over 50 million students, representing 89% of students in the nation in the public school system (Ripley, 2010), there is a need for immediate, effective, and lasting change where the greatest impact will occur—the teachers in the classroom. The data analysis from section 2 indicated that students whose teachers activated prior knowledge before proceeding with the LFS model of instruction scored statistically significantly higher on posttest assessments than students whose teachers only used the LFS model of instruction, $F(1, 863) = 35.398$, $p < .000$. This lesson plan design provides teachers a simple structure that is research-based and addresses the gap of activating students' prior knowledge before using LFS to introduce the main lesson. The lesson plan design would give teachers throughout the county a tool to ensure the teacher-level factors influencing student achievement would be effective, repeatable, consistent, and pervasive in all classrooms. If the teachers regularly used the lesson plan design, students retained the content, and there were annual increases in student achievement, then the schools and the school district should be able to pass AYP or at least reach the annual measurable objective and avoid further NCLB sanctions (L. L. Rambach, personal communication, August 17, 2010).

As seen in Appendix A, learning theory and the broad literature base on effective instructional practices grounded the lesson plan design. A well-designed lesson plan structure provides a means and a tool for teachers in the local school, and throughout the

county, to use proven and effective instructional strategies on a daily basis in all classes, all grade levels, and all subject matters. The lesson plan design could be included in the focus walk accountability reviews for teachers and schools, similar to the curriculum mapping, standards being studied, displays of student work, word walls, and so forth. The lesson plan design aligns with what teachers in the county should already have prepared for each lesson including the performance standard being studied, essential question, learning activities, and opportunities for individual learning or homework. The local county could easily implement the lesson plan design throughout the district.

Search Terms and Efforts to Find Research

The goal of the database searchers was to find and analyze literature or theories related to effective lesson plan designs, essential lesson plan components, lesson plans that activate a student's prior knowledge before starting the main instructional activities, general instructional designs, or previous means to increase student achievement. The database searches included ERIC, Education Research Complete, Academic Search Complete, PsycARTICLES, and the Teacher Reference Center. While other databases were searched, none provided relevant results.

The results for activat* prior knowledge in Education Research Complete for all dates, full text, peer-reviewed articles generated 13 results. Filtering the results from 2005 to present and from academic journals only reduced the number of pertinent articles to eight. The results for the database searches in ERIC, Education Research Complete, Academic Search Complete, PsycARTICLES, and the Teacher Reference Center generated limited results. For the search terms "lesson plans" and "instructional design,"

returned 34 articles. For the search terms "lesson plans," "educational methods," or "teaching strategies," returned 30 results. For the search terms "lesson plans" and "instructional design" and "activat* prior," no results were returned. For the search terms "lesson plans" and "instructional design" or "activat* prior" with subject as "instructional design," "teaching methods," "educational strategies," and "lesson plans," 26 results were generated; however, after review, 19 of the results were not relevant to this study.

Review of the Literature

The current literature reflected a diversity of measures to help students retain content and increase student achievement imposed on educational systems. One of the driving factors for increasing student achievement is the NCLB deadline of 2014 where all students must reach proficient status on standardized tests. There has been new research and seminal works that revealed successes and failures for school reform, intervention programs, and determining teacher quality. New studies continued to support that prior knowledge is critical to a student's learning, and low-SES can significantly affect a student's achievement.

Teachers must have an idea of the content, process, instructional strategies, and teaching supplies when preparing instructional lessons. The current literature gave a picture that, according to teachers' lesson plans, few students receive high-quality instruction. The literature indicated updated designs for lesson plans which included effective instructional strategies, constructivist lecture designs, improved methods for individual practice and homework assignments, ways to determine a student's prior knowledge, suggestions for deciding on the main learning goal, and steps for presenting

the lesson. Researchers reviewed 25 years of research and over 1,000 studies and concluded that differentiated instruction is not as effective as previously thought.

The literature reflected lesson design suggestions for teachers who teach students who may have less prior knowledge, reinforced research showing similarities and differences as an influential instructional strategy for helping students understand content, confirmed cues and questions is effective for activating a student's prior knowledge, and supported the literature that using data and formative assessments to make instructional decisions is valid. Lastly, the current literature specified exactly the qualities, attitudes, actions, and characteristics of an effective teacher as well as the importance of intentionality when designing and presenting instruction. As part of this project study, the literature review influenced the lesson plan sequence.

Current Findings

Many students are not demonstrating mastery of the required curriculum. One third (33%) of the schools in the nation did not make AYP in 2009, and more than a third (36%) of the school districts did not make AYP (Usher, 2010). In Georgia, 21% of the schools did not meet AYP in 2006, 18% in 2007, 20% in 2008, and 14% in 2009; following the same general trend, 65% of the school districts in Georgia did not pass AYP in 2006, 61% in 2007, 70% in 2008, and 60% in 2009 (Usher, 2010). As a nation, 69% of eighth-grade students did not meet proficiency in reading and 68% did not meet in math in 2009 (Ripley, 2010).

Researchers (Gill, 2008; M. Miller & Higgins, 2008) have suggested that after years of research indicating effective instructional strategies, teachers nationwide may

still not incorporate those strategies into lesson plans; have departed from what they know is good teaching; and may have been pressured to use a more published format of an instructional model, program, or test preparation materials for their classroom instructional strategies. The Center on Education Policy (2009c) noted that teachers may have at their disposal the instructional strategies to teach the broad middle range of students but may not be well equipped to teach students who are low or high achieving. Hedges (2000) noted that good teaching produces relatively permanent changes in students and good teaching includes drawing on the students' prior knowledge, personal histories, and current experiences. Hedges went on to summarize the learning process simply as having students do something they had never done before and then remember what they learned to the point that they could do it again. Various efforts to increase student achievement have been imposed on the educational system; of those efforts, school reform is common.

School Reform

Failures. Even though there have been school reforms for the past several years, not many have produced the expected student achievement results where students demonstrate mastery of the content. More than 5,000 of the 100,000 public schools in the U.S., serving 2.5 million students, are still considered chronically failing and may proceed into NCLB's most extreme designation of failure by 2010; the number of chronically failing schools has doubled in the past 2 years (Kutash, Nico, Gorin, Rahmatullah, & Tallant, 2010; Mass Insight Education and Research Institute, 2010). Wang, Haertel, and Walberg (1993) commented that most state and district initiatives for

reform, however well intentioned, have little effect on student achievement. Ripley (2010) reported that in 2009 after 30 years of data showing a decrease in student-to-teacher ratios and an increase of spending per pupil, the change in academic performance, in the U.S. of 17 year olds on a national reading test, was 0%. In 2008, more than 3,500 schools, (7% of all Title I schools) were in some form of restructuring representing a 50% increase over the previous year (Center on Education Policy, 2009d). In 2008, of the 184 Title I schools in Georgia, 43 schools were in the restructuring process; 77% (33) were middle schools. Reforming a school or school system is complex primarily because schools and school systems are comprised of "individual children with individual needs" (T. B. Jones & Slate, 2010, p. 6), many of the decisions are based on local data, and changes in a school or system are determined at the local level (Cicchinelli & Barley, 2010). It is necessary for local school and school system reform to start with assessing current student achievement and implement a means where best practices are shared across the school system (Center on Education Policy, 2009b; Cicchinelli & Barley, 2010; Kutash et al., 2010). Most schools or school systems are either dysfunctional to the degree they are not able to make appropriate changes and share best practice information or not equipped to be responsive to the low-SES students they tend to have (Mass Insight Education and Research Institute, 2010).

Even though school and school system reform is still an emerging process and has few proven experts (Kutash et al., 2010), four models of school improvement have become predominant: turnaround, restart, close, and transform (Cicchinelli & Barley, 2010). The models include

- turnaround by replacing the principal and rehiring no more than 50% of the teachers; create new governance; implement new instructional programs; recruit, place, and develop staff; and create new schedules,
- restart the school as a charter school and allow former students to attend if they choose,
- close the school and move the students to other higher performing schools in the area, and
- transform the school by using extensive data, community support and input, increase the learning time, and offer flexibility and strong support (Cicchinelli & Barley).

However, as Cicchinelli and Barley (2010) noted and others (Mass Insight Education and Research Institute, 2010) agreed, school reforms promise to "turn round low-performing schools" (Cicchinelli and Barley, p. 1), but few succeed. Many research-based intervention models and programs have been developed to increase student achievement in low-SES schools, but the models have not shown immediate effects (What Works Clearinghouse, 2008). Attempts to turn around the lowest performing 5% of schools as of 2007 have largely failed, and those schools need "fundamental rethinking and not incremental change" (Mass Insight Education and Research Institute, 2010, p. 1).

As researchers have indicated, most of the gains in student achievement (80% - 90%) can be attributed to student-level factors (Z. Barley et al., 2002; Jacobs & Harvey, 2005; Marzano, 2003c; Rothstein, 2008; Schochet & Chiang, 2010). For schools that have been restructured and passed AYP, few people exiting the restricting process could

point to any one strategy that was key to improving student achievement (Center on Education Policy, 2009d).

Successes. In Georgia, even though the primary focus for improving schools is determined at the district level, a new approach has been developed to help restructure the schools that have not met AYP for 6 or more years (Center on Education Policy, 2009b). In general, monitoring and intervening from the state level occurs earlier than required by NCLB. As part of a pilot project sponsored by the U.S. Department of Education in 2008, Georgia was able to use federal funds to assist schools in need of restructuring by sending additional personnel to the local schools to guide improvements and staff training. In 2007/2008, of the 46 schools in restructuring, 63% of the made AYP in the spring; however, as the Center on Education Policy (2009b) noted, it is unclear if the number of schools exiting the restructuring process was due to the state's intervention, the "low bar for proficiency on state tests" (p. 1), or test difficulty (2009d). The Center on Education Policy (2009b) noted that two different studies showed Georgia had among the lowest proficiency standards for student achievement in the nation during 2004/2005 school year. However, Marsh and Robyn (2006) indicated that because of the decision to place data at the center of school reform, Georgia is in the mainstream of education theory and research for improving schools.

For schools who fail AYP for a specific subgroup (such as students with disabilities), the state helps those schools target instruction, guide the teachers and administrators in the Georgia Performance Standards, and use instructional best practices based on the research of Robert Marzano and his colleagues (Center on Education Policy,

2009b). For schools that have not made AYP for 5 years concurrently, the state assigns a contact monitor for the school, forms agreements and a contract with the school, and reviews short-term progress every 4 to 6 weeks—steps usually begun in the seventh year of failing AYP. In 2008, 12 of the 19 schools under the direction of the contact monitor made AYP; 7 schools for the first time (Center on Education Policy, 2009b). In some cases, school reform is not required, but improved instructional programs are necessary.

Programs

Various educational programs have been created to improve student achievement. For low-achieving, high-poverty schools, Slavin, Lake, and Groff (2009) warned that those educational institutions should incorporate only proven educational programs. Lynch and Warner (2008) noted that, in brain-based instruction, students are better prepared for learning neurologically when they are in a comfortable environment, appropriately challenged, and are able to attach meaning to new concepts through associations (i.e., prior knowledge). Similar to LFS, Lynch and Warner noted that gaining a student's attention is the anticipatory set or focus and serves as an introduction to the activities of the lesson, but not as a means to activate prior knowledge. Early intervention programs designed for low-SES students can be effective if the children attend (Goodwin, 2010a).

Barley and Wegner (2010) noted that of the 1,000 school districts required to offer supplemental educational services (SES) in 2004, approximately 20% of those schools had no students involved. SES, as mandated by NCLB for schools that repeatedly under perform in increasing student achievement (U.S. Department of

Education, 2004), may not be effective in some locations as students may not be able to attend the after school service due to after school sports activities or work (Z. A. Barley & Wegner, 2010). Other hindrances for effective SES can be the lack of participation of the principal in promoting the service, weak relationship with providers, and poor communication with parents (Z. A. Barley & Wegner, 2010). According to Barley and Wegner's (2010) study, in 2004 only 17% of eligible students participated in SES nationwide and in 2007, in the high plains area, only 11%. Particularly in low-SES schools, teachers need to use the most effective instructional strategies, and schools as a whole, need to use the most effective programs when teaching low-SES students (Z. Barley et al., 2002; Hollins, 2006; Payne, 2008; Popham, 2008; Slavin et al., 2009).

Schools and Teachers

Researchers agreed that the teacher is the most important factor for increasing student achievement in the school (Haycock & Crawford, 2008; Marzano, 2003c; Rubie-Davies, 2007; Snook, O'Neill, Clark, O'Neill, & Openshaw, 2009). According to Cicchinelli and Barley (2010), schools face increasing numbers of students who are neither prepared nor equipped for school in general or the classroom environment in particular. There are only a few school factors that directly affect student achievement at all, and most of the school factors are not critical in increasing student achievement (Goodwin, 2010a); "the only way to improve [student] outcomes is to improve instruction" ("Characteristics of the world's high-performing school systems," 2008, p. 9). In Georgia, lawmakers acknowledged that the quality of a child's education depended on the quality of each teacher (Sabulis, 2010; Sarrio, 2010) and were trying to determine

new ways to evaluate and pay teachers. Changes to the evaluation system include tying annual evaluations to student achievement data, conducting principal observations, and using peer reviews (Sabulis, 2010). Veteran teachers will have the option of participating in a new pay scale that ties salary to student achievement, but new teachers will be automatically enrolled in the new pay system (Sarrio, 2010). When hiring teachers, leaders should not only examine if the candidate has thorough subject matter knowledge but also strong pedagogical knowledge and command of, and confidence in, a number of instructional strategies to teach that subject; the quality of the teacher is the difference between student success or student failure and possibly school success or school failure (Goodwin, 2010b; Hanushek & Rivkin, 2010). During the hiring process, some high-poverty, high-performing schools inform the teacher candidates that their teachers must participate in professional learning communities, sponsor after school activities or clubs, collaborate with colleagues, maintain lesson plans and data from formative assessments, or continue to stay up to date on current educational research (Chenoweth, 2010). There can be vast differences in schools, teacher effectiveness, and the kinds of learning teachers produce, and students who have teachers with strong content knowledge and pedagogical skills can gain as much as a full year more learning than those students who have ineffective teachers (Goodwin, 2010a; Hanushek & Rivkin, 2010). Haycock and Crawford (2008) pointed out that students who were taught by (a) teachers in the top quartile of teacher effectiveness increased approximately five percentile points compared to their peers, (b) teachers in the lower quartile effectively decreased students' achievement by five percentile points relative to their peers, and (c) the effects of both

groups were cumulative. To help ensure all students have an effective teacher in every classroom, lawmakers have either implemented or considered linking teachers' annual evaluation directly to student achievement data (Downey, 2010).

Researchers generally agree that there is only a weak association between teachers' credentials, experience, and education and increasing student achievement (Hanushek & Rivkin, 2010; Mid-continent Research for Education and Learning, 2008; Schochet & Chiang, 2010). A teacher's credentials, experience, advanced degrees, or knowledge of the subject matter alone does not ensure high-quality teaching or guarantee student success; schools benefit more from hiring good teachers, developing teachers into effective teachers, and track student data and provide additional support as needed (Goodwin, 2010a, 2010b; Hanushek & Rivkin, 2010; Schochet & Chiang, 2010). The probability of success in increasing student achievement at the local school level, and throughout school systems, is strengthened when teachers use the best research-based instructional practices for each child every day ("Characteristics of the world's high-performing school systems," 2008; Payne, 2008; Popham, 2008). When asked what effective measures were recorded for schools in Georgia that exited restructuring, staff members attributed five reasons for their success: teachers tracked and intervened when students' grades dropped, the school's schedule allowed more time for remediation, ineffective teachers were replaced with effective teachers, new teachers received significant training, and local school management improved (Center on Education Policy, 2009b).

Prior Knowledge

Meaningful learning occurs when students use their prior knowledge to connect new and meaningful content to their existing knowledge, and prior knowledge is more critical than most other learning variables (Gurlitt & Renkl, 2010). Prior knowledge is a learner's content knowledge as it relates to a specific domain and may contain various forms of knowledge or skills (Hailikari et al., 2008, p. 1). The importance of a student's prior knowledge is well documented. A student's prior knowledge, or background knowledge, has long been considered one of the most important determinants in a student's learning, predictors of achievement, factors in increasing student achievement, influences a student's acquisition of content, and experiential bases of knowledge that students bring into the classroom (Cook, 2006; Gurlitt & Renkl, 2010; Hailikari et al., 2008; Marzano, 2003c; Muller-Kalthoff & Moller, 2006; Wang et al., 1993). A student's prior knowledge is a factor in how much working memory is available to process new content simultaneously and is the foundation for constructing new knowledge (Cook, 2006); a lack of prior knowledge can hinder learners from transferring knowledge to new situations (Thomas, 2007). The more a learner knows about a topic, the more they are able to make connections, organize the new content, and relate the new knowledge to what they already know; otherwise, the new material will be disconnected and considered by the student as nonsense (Gill, 2008; Muller-Kalthoff & Moller, 2006). Researchers (Muller-Kalthoff & Moller, 2006) found that students with more prior knowledge scored higher overall on the final assessments than did students who had less prior knowledge;

this finding is corroborated as seen in the results of the data analysis of this study presented in section 2.

Teachers should note the variances in a student's prior knowledge as not all of a student's prior knowledge is related to student achievement for the particular content. Students may have knowledge of facts or definitions (considered surface learning or rote learning) which may not provide the student with an integrated picture of the entire concept or skill; or, they may have procedural knowledge which allows the student the capacity to understand, integrate, and apply concepts to new relationships or problem solving activities (Hailikari et al., 2008). Prior knowledge from similar domain-specific courses does influence student achievement. As educators become aware of the importance of how prior knowledge affects learning and achievement, educators may be more conscientious to incorporate activities that activate a student's prior knowledge into their lesson plans and then determine the amount of student support necessary for each learning activity (Cook, 2006; Gill, 2008; Hailikari et al., 2008). Teachers should be aware that a child's socioeconomic status might influence their prior knowledge.

Low-Socioeconomic Status

Students bring to school the factors that account for the largest differences in student achievement: their personal abilities, individual attitudes, family influences, and community contexts (Snook et al., 2009). Goodwin (2010a) reiterated Marzano's (2000) research that showed 80% of student achievement can be directly related to the student-level factors of home environment, prior knowledge, aptitude, and student's interest and motivation. Hodgkinson's report (as cited in Goodwin, 2010a) listed factors that can be

associated with decreased student achievement in school such as poverty, low birth weight, single parents, teen mothers, transience, child abuse, child neglect, lack of proper medical care, and poor nutrition, among others. These low-SES factors affect student achievement over an extended period as well as the initial year of a child's education. Lower-SES students probably have less prior knowledge than their higher-SES peers (Barnett, 2010). Neuman (2003) reported substantial disparities between lower-SES children and their higher-SES peers: higher-SES children had 46 percentile points higher in alphabet recognition, 41 percentile points higher in initial word sounds recognition, 21 percentile points higher in primary color recognition, 20 percentile points higher in the ability to count to 20, and 22 percentile points higher in the ability to write their own name. Neuman further noted that children from higher-SES conditions have been read to approximately 1,000 hours before Kindergarten whereas children from lower-SES conditions have been read to 25 hours; the overall word exposure is 13 million words for low-SES children and 45 million words for high-SES children. Wang et al. (1993) noted that the home environment is central to a student's life and can amplify or diminish the overall effect of the school. Teachers need to account for language and experience disparities in their lesson plans when teaching students from low-SES environments.

Lesson Plans

When preparing lessons, teachers must make a myriad of choices from curriculum to instructional strategies to materials that may assist the learning process (Goodwin, 2010b; Pacchiano, 2000; Weiss & Pasley, 2004). When writing lesson plans, Rockwell (2008) indicated that teachers should design a plan that is based on well-documented

principles and instructional strategies, which would allow teachers to teach and students and learn more efficiently. Researchers (Weiss & Pasley, 2004) have found less than 20% of teachers adequately or effectively ask questions or provide enough rigor in their lesson designs. According to a recent study of 364 lessons, few students receive high-quality instruction, and specifically for math and science lessons, 85% of the lessons were considered low to medium in quality (Weiss & Pasley, 2004). Most U.S. schools fall "very short" (Weiss & Pasley, 2004, p. 25) of providing high-quality lessons for all math and science students. According to Hedges (2000), lesson planning is what the teacher does before writing down each detail. Then the teacher should think through, reflect on the learning goal(s), and then determine the proper methods for instruction. After determining the lesson content, the teacher can write down a systematic approach for guiding students through the learning process (Hedges).

Design. All lesson plan designs should take into account a means to determine, activate, and incorporate students' prior knowledge into the instructional lesson (Wang et al., 1993). In developing a lesson plan, Hedges (2000) suggested teachers ask four basic questions: where are we now, where are we going, how do we get there, and how do we know when we have arrived? More formally, Hedges presented the steps as prepare to teach; present the lesson; help students apply the knowledge, concepts, or skills; and then evaluate student learning. In a more specific design, Lynch and Warner (2008) recommended that the lesson design include

- understanding students' prior knowledge,
- a device to gain students' attention—similar to the LFS essential question,

- the main part of the lesson designed to present the main learning goal through activities, checks for understanding through formative assessments, modeling, or guided practice,
- closure or review of the lesson,
- extensions of the lesson,
- opportunities for independent practice, which may allow the teacher to reteach portions of the lesson,
- evaluation of the lesson by assessment, and
- reteaching based on the student assessment if necessary.

Constructivist lecture design. Constructivist learning is considered an active process where students create their own meaning, interpretation, and understanding of the material (Marzano, 2010). Through a controlled experiment, Prakash (2010) prepared a series of lectures to see if lecture could still be considered an effective means to create a constructivist-learning environment. Prakash acknowledged that activating a student's prior knowledge was an important component of effective lessons and designed the lectures for the treatment group to include multiple questions during the lecture to help students recall prior knowledge. The results of the posttest showed that the treatment group scored significantly higher than the control group. Prakash's constructivist lesson design included

- bringing together a student's prior knowledge,
- engaging students through a series of questions designed to activate their prior knowledge,

- using the scientific method of question, predict, observe, and explain to prepare students for further individual exploration of the subject of the lecture,
- explicitly helping students construct their own knowledge and understanding of the material,
- talking with students until misconceptions were corrected, and
- providing an opportunity for students to interact with the material on their own to explore, discover, and gain greater understanding of the material.

Individual practice and homework. To provide opportunities for students to interact with the material on their own in a constructivist environment, Marzano (2010) recommended that teachers allow time for students to practice the material either in class or through guided homework assignments. During the early stages of a student's awareness and executing a specific skill or general strategy, the level of practice may be minimal, but for students to achieve mastery and demonstrate autonomy of a broad process that combines both skills and strategies, Marzano said that, "practice is essential" (p. 81). After synthesizing more than 800 meta-analyses studies that related to student achievement, Hattie's analysis (as cited in Snook et al., 2009) found homework for high school students had a substantial effect size of 0.69 but a smaller effect size for elementary school students; he also reported that homework had a large effect size for previously low-achieving students but a small effect size for previously high-achieving students. Effective strategies for individual interaction with the material include (a) homework practice using the technique of interleaving where students may be assigned 10 math problems but 5 are worked in detail to facilitate a student's understanding of the

underlying guiding principles, or (b) in-class practice where the teacher asks students to verbalize, analyze, and explain their thought processes that led them to the conclusions. Whatever individual practice design is incorporated into the lesson plan, practice can be differentiated.

Differentiated instruction. Many researchers (Deissler, Fondriest, & Marlar, 2007; Dunn et al., 2010; Georgia Department of Education, 2008e; Gomez, 2009; Hickey, 2006; Huebner, 2010; Levy, 2008; Lynch & Warner, 2008; M. Thompson, 2009k; Tomlinson, 2005; Villa, Thousand, Nevin, & Liston, 2005) recommend and insist that teachers consider, plan, and provide multiple opportunities for differentiated activities to allow for a student's diverse learning styles, ability levels, and personal characteristics in each lesson. The main concept behind differentiated learning is the premise that all students come to school with differing personalities, learning styles, and modalities; as a result, the teacher must appeal to each student's modalities, interests, rates for learning, and level of complexity in each lesson and allow for differentiated, individual practice activities and demonstration of content mastery (Goodwin, 2010a). The problem with differentiated instruction, according to Goodwin (2010a) is that there is not a single piece of empirical, statistical evidence that indicates differentiated learning has a positive effect or significantly increases student achievement. Even across cultures such as Alaskan Natives, Caucasian, or African American students, after 25 years of studies, no evidence has been found that suggests certain teaching strategies or differentiation is more effective with particular cultural groups than others (Goodwin, 2010a). Goodwin suggested possibilities for the lack of data: lack of scientific studies,

differentiated instruction is too difficult to implement and too difficult to study, and differentiated instruction is founded on flawed premises. Goodwin pointed out that in the current research

- Tomlinson's own research indicated that schools claiming they were differentiating instruction on a school-wide basis in fact had few teachers using differentiation on a regular basis,
- a meta-analysis of 61 studies revealed that grouping students according to their ability level benefited higher-achieving students more than lower-achieving students and widened the achievement gap,
- of 400 studies that studied aligning instruction with a student's learning styles, indicated there was only a slight effect over what would be considered normal teaching, and those effects are in doubt due to "serious methodological flaws" (p. 13),
- of a meta-analysis of 39 studies, the learning styles of students overlapped other learning styles to such a degree that it was questionable if students learning styles could be labeled learning styles at all, and
- of 600 studies reviewing teacher instruction based on student's interest and prior experiences revealed only slightly better effects than would be found in a regular classroom.

Goodwin (2010a) noted that the data do not necessarily reflect differentiated instruction does not work, but that it is an inconsistent instructional strategy and is not necessarily a critical variable to regularly increasing student achievement. Further, in a

recent study, the Institute of Education Sciences (2010) concluded that the evidence was low for differentiated instruction for reading in the primary grades. Neither Goodwin nor the Institute of Education Sciences recommended that teachers stop using differentiate instruction.

Determining prior knowledge. To help determine the level of prior knowledge students have for a particular subject, some teachers give an assessment before starting the learning unit in the form of a pretest. Pretests provide data to help teachers determine a student's level of understanding, identify the appropriate point for starting the learning unit, connect the teacher's expectations with a student's actual amount of prior knowledge, or provide a means to group students for the activities (Hailikari et al., 2008). Hailikari et al. (2008) found that students felt the pretest was beneficial because the students became aware of their weak points. Other reactions to the pretest assessment were that students felt that the teacher cared about them and their individual learning (Hailikari et al.). Using pretest assessments is an effective strategy for teachers to gain an understanding of their students' level of prior knowledge, but during the learning unit, data and formative assessments give the teacher insight into students' level of understanding.

Main learning goal. While the lesson plan in itself is a critical element in helping a teacher guide instruction, one of the most important and fundamental components of a high-quality lesson is exploring worthwhile content where students have the opportunity to interact with the content on multiple levels (Weiss & Pasley, 2004). According to Cook (2006), a high-quality lesson should have a main learning goal that

maximizes students' personal history, resources, and prior knowledge to learn the content. To help novice teachers determine content to cover and presentation styles, researchers (Calandra, Brantley-Dias, & McNeal, 2007) recommended that teachers identify the specific curriculum that needs to be covered, understand the standards for that content, and observe the overall teaching context of that content. Specifically, Calandra et al. (2007) recommended that teachers know the level of their students' prior knowledge, their current skill set, their overall attitudes are as they relate to the content, their preferred learning styles, as well as the cultural context of the students. Calandra et al. further pointed out that a lesson about iron ore would be presented differently to students who live in an upscale (high-SES) urban area than one presented to students living in a rural (low-SES) mining town.

Presentation. Pacchiano (2000) noted that while there are important considerations for what teachers should teach, such as aligning content to a student's ability so that there is a high student success rate, teachers should effectively monitor a student's progress and offer choices for learning and demonstrating of mastery. Regarding the actual instructional presentation, Pacchiano recommended four elements:

1. The teacher should provide an overview of the lesson so that students know how the content will be organized, what the students are to learn, the order the teacher will be covering the content, and how students will interact with the content.
2. The teacher should separate the lesson into smaller instructional units and present the units in a sequence. The sequence should activate students' prior

knowledge and move from concrete concepts to more abstract. The teacher should monitor a student's progress of the content through formative assessments and allow for differentiated learning and practicing opportunities.

3. The teacher should maintain a brisk learning pace and momentum through nonverbal and unobtrusive classroom management techniques.
4. The teacher helps students self-manage their own learning to include the comprehension of the material, the details and expectations of the required assignments, and the steps necessary to completing the work.

In low-SES schools where students probably have less prior knowledge and personal experiences, certain lesson plan design elements may also be included. Prakash (2010) recommended that teachers who use lecture, base their lecture material on students who may have less prior knowledge and allow for constructivist learning so that all students could benefit from the lecture.

Lesson Design in Low-Socioeconomic Schools

All students deserve high-quality instruction irrespective of their demographics or school location (Weiss & Pasley, 2004). In Muller-Kalthoff and Moller's (2006) study, they noted that well-designed instructional materials and supports were of greater benefit to students with less prior knowledge in a given domain than to students with higher prior knowledge. Hailikari et al. (2008) noted that a student's prior knowledge could be incomplete or incorrect and that if a teacher did not understand a student's prior knowledge, then students could resort to rote memorization and learning could be minimized from the beginning of the unit.

Cook (2006) noted that students with limited prior knowledge have difficulty differentiating between relevant and irrelevant material and had more difficulty navigating through complex processes or relationships. The teacher should design clear lessons that do not present "extraneous material" (Cook, 2006, p. 1085) in the learning activity that might distract students with less prior knowledge from the main content. Researchers (Cook, 2006; Muller-Kalthoff & Moller, 2006) showed students with less prior knowledge benefited from a teaching strategy that provided a structured overview with limited diversions and recommended that teachers incorporate instructional guidance during the lesson. Hailikari et al. recommended that teachers integrate a student's prior knowledge into the learning environment so that students could construct new knowledge on top of their prior knowledge. Learning activities that help students see relationships in content create a constructivist-learning environment.

Similarities and Differences

Even a substantial number of facts as standalone components does not help students achieve, but the relationships and interrelations of those facts contributes to increased student understanding (Hailikari et al., 2008). Researchers (Mid-continent Research for Education and Learning, 2010) have shown, and continue to support, the data that identifying similarities and differences is one the most effective instructional strategies for helping students find, see, and understand the relationships and interrelationships found in content. Pacchiano (2000) recommended that teachers explicitly show relationships to students of when using examples and presenting new content. Goodwin (2010a) pointed out that teachers should not only have a number of

effective teaching strategies available for instruction but also know which strategy to use, when to use it, why to use it, and how it will affect student learning. Another effective instructional strategy is one that activates students' prior knowledge.

Activating Students' Prior Knowledge

Novice teachers tend to disregard individual student's prior knowledge, the importance of helping students make connections between prior knowledge and new content, tend to assign a group level of knowledge to a class, and then create lessons designed around the assigned group identity (Calandra et al., 2007). Rather, as part of the lesson, teachers start the lesson at the point of students' knowledge and experience, explicitly activate students' prior knowledge, and then incorporate students' prior knowledge, personal history, and current experience as much as possible to create interest and motivate students to be engaged in the learning process (Gurlitt & Renkl, 2010; Hedges, 2000).

Particularly for low-SES and at-risk-of-failure students, the teacher should explicitly ask students to recall what they already know about the topic, activate that prior knowledge, and make connections during the lesson so that the lesson goes "from the known to the unknown" (Gill, 2008; Hedges, p. 17; Rockwell, 2008). Some teachers regularly activate students' prior knowledge in a broad way through detailing necessary background information, providing subject context, or using Internet searches to help students make connections to the new content; after connections are made, the material is easier to understand (Rodriguez, 2009).

Questions. To help students bring to mind what they already know, researchers (Azevedo, Moos, Greene, Winters, & Cromley, 2008; Hedges, 2000) suggested that teachers use cues and questions to activate and probe students' prior knowledge, promote students' mental engagement in the lesson, and prompt students to uncover more information. To know a student's level of knowledge, a teacher can simply, "ask the student what he/she already knows" about the particular subject (Azevedo et al., 2008, p. 51). Weiss and Pasley (2004) noted that, during a high-quality lesson, teacher's questions are critical in helping students understand relationships between old and new content.

Kruse (2010) outlined Gagné's nine instructional events, which allows comparison to the LFS model of instruction. The first three instructional events were designed to gain students' attention, tell students the learning goals for the lesson, and activate students' prior knowledge. Kruse noted that gaining students' attention could be achieved through asking a "thought-provoking question" (para. Gain attention) which is similar to LFS's essential question. According to Kruse, the second step is to inform students of the learning objects for the lesson; there is no straightforward parallel to the LFS model. The third step in Gagné's process is an explicit action on the part of the teacher to activate a student's prior knowledge through asking specific questions related to a student's experiences or understandings; LFS does not specify activating a student's prior knowledge as a required step in the learning model.

Using Data and Formative Assessments to Increase Student Achievement

The most frequently used strategy by schools and districts across the county to change the effectiveness of schools is the increased use of student achievement data (Marsh & Robyn, 2006). Schools that use formative and summative data to drive instructional decisions to meet students' learning needs are following not only the best advice from educational leaders but also from the world of business—this is wise as schools are in the business of education (Marzano, 2003b). The Mass Insight Educational and Research Institute (2010) noted that chronically low-performing schools that made a successful turnaround into high-performing schools act like "highly entrepreneurial organizations" (p. 5). Schools that have been restructured, and subsequently have passed AYP, all have one element in common: using student achievement data to make instructional decisions (Center on Education Policy, 2009d). Schools and school districts should be careful to judge a student's academic achievement based solely on state wide standardized tests. While state wide standardized tests are to assess the state mandated curriculum that should be covered in each core area, state tests cannot possibly assess what a student may know in concepts or processes for that subject (Marzano, 2003b). Students may know more about a subject than is covered on a standardized test. Local data and formative assessments can provide valuable information in guiding instruction.

Data. Continually using data can help teachers monitor their effectiveness and provide information to assess a student's level of mastery of the content. Assessments and formal data provide the means for a teacher to (a) determine the extent a student

understands the material, (b) which students have retained the material, and (c) determine the overall teacher's effectiveness (Hedges, 2000). Data from high stakes assessments, district benchmark tests, unit tests, or projects can be a form of data can help practitioners' monitor student progress and inform instructional decisions (Hamilton et al., 2009). High stakes data can help inform large-scale decisions, but formative assessments help guide teachers' decisions and adjustments of instruction in the classroom setting.

Formative assessments. Using ongoing formative assessment data can be a way for teachers to structure lessons geared toward continuous instructional improvement with the goal of improving their ability in meeting a student's educational needs (Hamilton et al., 2009). Researchers (Calandra et al., 2007; Swinson, 2009) have suggested that teachers use multiple formative and summative assessments to gain an understanding of their students' current level of progress and understanding; in a smaller setting such as tutoring, teachers can adjust instruction based on ongoing formative assessments and observations of the changing level of a student's understanding (Azevedo et al., 2008; Swinson, 2009). Marzano (2003a) referred to Black and Wiliam's conclusion that using formative assessments effectively can raise student achievement 0.70 of a standard deviation; on a national scale, 0.70 of a standard deviation could raise students' math achievement from an average country like England or the United States to a top five country after Singapore, Hong Kong, and several other Asian countries. Using formative assessments can increase a teacher's effectiveness.

Effective Teachers

After decades of research and hundreds of meta-analysis on the teacher effect in increasing student achievement, the results are clear: effective teachers used effective instructional strategies, set high expectations for their students, and had positive relationships with their students (Goodwin, 2010a; Jackson, 2008; Swinson, 2009). Effective teachers have high expectations and challenge all of their students while providing quality instruction, have positive relationships and rapport with their students, and are clear about the learning goals and have competence in various instructional strategies to help students reach those goals (Goodwin, 2010a). Effective teachers do not need alternative or unusual instructional strategies to increase student achievement, effective teachers use proven instructional strategies with skill and purpose. Effective teachers have an array of proven teaching techniques at their disposal, are able to determine when and which one(s) to use in any given subject matter or for any given student, how to use a particular strategy, why that particular strategy works, and then use those strategies to promote student learning (Goodwin, 2010a; Marzano, 2003b). Effective teachers "perform multiple activities simultaneously" (para. 5) to engage and guide student learning and make explicit connections to a student's prior knowledge (Pacchiano, 2000). Effective teachers create a classroom conducive to learning, deliver instruction in an effective presentation that maximizes a student's ability to comprehend the content, understand the relationship of new content to previous content, and allows students to respond correctly and repeatedly to formative and summative assessments (Hedges, 2000; Pacchiano, 2000).

Effective teachers direct the learning process and communicate effectively with their students. Hedges (2000) urged teachers not only to plan and to present quality lessons but also to remember that students have had different experiences from the teachers; teachers' level and mannerisms of communication might not be understood by the students. Teachers should communicate clearly, give complete directions, and set clear expectations. Waters (Mid-continent Research for Education and Learning, 2010) pointed out Hanushek's research that indicated after a single year in school with a highly effective teacher, students might gain as much as one-and-a-half year's learning; in contrast, a student in school for 1 year with a highly ineffective teacher would gain only one half year of learning.

Intentionality

When asking one teacher why they had students read a book, draw a character, write an alternate ending, and then redesign the book cover, the teacher simply responded that the students should just read the book and then "do something with it" (Tomlinson, as cited in Goodwin, 2010a, p. 12); the teacher had not understood the impact of intentionality. Student achievement increases when teachers clearly and intentionally teach predetermined learning goals with proven instructional strategies and appropriate student feedback (Goodwin, 2010a). Teachers should reflect the curriculum to be taught, design a lesson promoting students' engagement and learning of the material to higher levels, activate students' prior knowledge intentionally, help students see relationships to create a strong learning environment, and present the lesson to the students; the teaching

process is planned, presented, and always has purpose (Hailikari et al., 2008; Hedges, 2000).

The Project

A well-designed lesson plan should incorporate strategies that are specific to enhance learning and help students retain content. As suggested by the cognitive load theory, students with less prior knowledge are likely to have more limited working memory at their disposal. The lesson design should activate students' prior knowledge so that the students with less prior knowledge are not overwhelmed (Cook, 2006). Muller-Kalthoff and Moller (2006) suggested that researchers and teacher practitioners make use of new lesson plan designs that take individual variables, such as a student's prior knowledge, into account before proceeding with instruction. There is a need for a lesson plan design that allows teachers to activate students' prior knowledge using cues and questions before using LFS to introduce the main instructional activities.

To help offset some of the low-SES factors that limit a student's prior knowledge, the lesson plan design specifically and repeatedly provides teachers time to meet the needs of low-SES students by activating a student's prior knowledge before using LFS to proceed to the main learning goal. The lesson plan design includes other effective teaching strategies such as setting teacher expectations, using formative assessments, identifying similarities and differences, and providing for individual interaction with the new content.

The lesson plan design created for this project study incorporates researched, effective lesson plan components and instructional strategies to maximize student

learning and increase student achievement. The lesson design begins with the teacher interactively presenting the curriculum standard on which the lesson is based. Reviewing the standard and activating a student's prior knowledge of the standard helps set the lesson, the learning goal, and students in perspective of the overall curriculum. The next portion of the lesson design presents what activities students will be using to learn the content for that standard while prompting students to incorporate learning from previous standards, lessons, and activities.

The second component of the lesson design is where the teacher explicitly states the expectations of what students are to learn, accomplish, improve, or develop during the instructional time. There can be more than one learning goal, but the teacher must state those goals explicitly. In following researchers' recommendations, the learning goal should be short, specific, and not overwhelming.

The third component of the lesson design provides for activating a student's prior knowledge. This component should be highly interactive between the students and teacher and driven by the teacher's knowledge of where the new content begins. The teacher should use cues, prompts, questions, or other means to help students recall individually and collectively their prior knowledge, experience, or beliefs and draw on their personal histories, attitudes, or backgrounds to prepare for the new content. The teachers should continue activating students' prior knowledge until all relevant or applicable information is presented before the class. After activating students' prior knowledge, the teacher explicitly links, in multiple ways, the new content to students' prior knowledge.

The fourth component of the lesson sequence sets forth the teacher's expectations for the class. The expectations present how students will demonstrate understanding of the main learning goal by answering a prompt or essential question. Expectations also include specific requirements for the organization, transitions, or participation in the class. If rules or procedures have not been established previously for the particular learning activities, then the teacher would need to state expectations for student behavior during the class, making transitions, and for ending class during this component.

The fifth component of the lesson sequence details the exact activities the teacher will use to help students learn the material. The teacher begins this component with a participatory activating strategy that helps each student recall specific prior knowledge pertinent to the lesson. The next portions outline the main learning goal(s) content or skill to be studied and how the lesson will end. At that point, the teacher begins the lesson presentation.

During the lesson, the teacher is encouraged to monitor student engagement, performance, attitudes, and understanding though cues and questions, informal (verbal) assessments, and visual observations. The teacher is encouraged to help students understand the content by pointing out similarities and differences to prior learning, showing relationships to earlier content, or making comparisons to other prior events. At some point, the teacher should allow time for students to interact with the material individually during class, give feedback, and then give appropriate activities that students can practice on their own time.

The areas of research supporting this lesson plan design, teaching to a specific standard aligned with state curriculum, identifying specific learning goals and activities, using specific strategies to activate a student's prior knowledge, and leading the activities with an instructional prompt, all support teacher intentionality. Additional areas of research include the teacher giving explicit directions; designating a beginning, middle, and end to the lesson; using proven effective instructional strategies such as identifying similarities and differences; providing time for individual practice; and setting expectations for an orderly classroom. Other areas of research, as presented in this study, include designing lessons using a lesson plan that specifically designates and incorporates using effective instructional strategies, lesson efficiency that minimizes extraneous material, sets forth a presentation that gives students an overview of the lesson through subparts, and is flexible enough that the teacher can communicate easily.

The lesson plan design created as part of this project study is appropriate to the problem at Tiger Middle School, the local school district, and schools across the nation that use the LFS model of instruction because the lesson plan design

- is research-based from a well documented broad range of literature,
- is standards-based appropriate to schools, districts, and states using a standards-based curriculum,
- is effective in increasing student achievement over using LFS alone to a statistically significant degree, $F(1, 863) = 35.398$, $p < .000$, as shown in section 2 of this study,

- includes proven teaching strategies based on learning theory, and
- could help eliminate disparities in teacher effectiveness.

The lesson plan design helps set the tone for creating the learning environment, setting the overall expectations for the class, and providing an overview of the main learning goal(s) for the students. The lesson plan design provides a simple and effective sequence and adjusts for any subject matter or grade level.

The criteria used to develop the lesson plan design were based on learning theory, effective instructional strategies, and research from the literature review that indicate how effective teachers make a difference in student achievement. Research that informed the project came from various sources and countries. Research was reviewed from the vast, high-quality research of the Mid-continent Research for Education and Learning, the American Psychological Association, the Center for Education Policy, the Institute of Education Sciences, the Committee on How People Learn, the U.S. Department of Education, and researchers including John Bransford, Suzanne Donovan, Michael Fullan, Robert Marzano, James Popham, and Max Thompson. The LFS model of instruction does not provide for activating students' prior knowledge particularly well in practice, as indicated by the results of the data analysis for this study presented in section 2, nor does LFS significantly increase student achievement in a low-SES middle school after 8 years of use by trained practitioners as seen in Table 1. Learning theory researchers suggested activating a student's prior knowledge is critical and should be included in every lesson. Research organizations and researchers have shown that

- prior knowledge is the basis for all future knowledge,
- an effective instructional strategy to increase student achievement activates a student's prior knowledge before starting the main portion of the lesson,
- knowledge can be domain specific and should be activated before adding content of skills to that domain,
- teacher expectations set the tone and the boundaries for the learning environment,
- the teacher is the most important factor for increasing student achievement,
- the available research on the effectiveness of LFS is limited,
- the research to support the LFS student achievement claims is unavailable, and
- the quickest way to raise student achievement is to raise teacher effectiveness.

Implementation

Working in collaboration with the local administrators, the faculty will see the results of the data analysis as presented in section 2 by a presentation and receive the lesson plan design and the APK/EQ grid. The faculty will have the opportunity to interact with other subject and grade level teachers to personalize the lesson plan sequence and ask each other questions. A timeline for implementation would be established, means of communication detailed, and thoughts for accountability presented. As part of the regular focus walks, the administrators could collect data on teachers' use of the lesson plan, collect pre and posttest assessment scores, and ask teachers for their

input regarding the design. After reviewing the results, arrangements would be made for follow up sessions where teachers could ask questions or make adjustments.

Resources and Supports

To implement the lesson plan sequence, teachers and administrators would need only basic computer and local resources. The lesson plan design would need to be prepared in Microsoft Word, Microsoft Power Point would display presentations, electronic mail would distribute the lesson plan and provide for communication, computer space would store the documents, and computer printers would create hard copies. Existing supports for the implementation include the Tiger Middle School principal, the district level representatives in the school, teachers at Tiger Middle School, and stakeholders interested in seeing increased student achievement at the school.

Potential Barriers

A potential barrier to incorporating the lesson plan project at the local and district level is the resistance to change. Levels of communication, time, and accountability would be determined before proceeding with the project implementation at the school and district level. As Hall wrote (as cited in Ellsworth, 2000), "Change is a process, not an event" (p. 147). Ellsworth pointed out that there is resistance to change, and resistance can be categorized in the form of cultural, social, organizational, or psychological barriers. The barriers can extend from a difference in values, to rejection of ideas, threats of power, organizational climate, and to individual's personality; the goal of lesson plan design is to have the participants (teachers) improve themselves or improve those (students) to whom they serve (Ellsworth, 2000).

To plan for change, Ellsworth (2000) pointed out, (through the Concerns-Based Adoption Model), that the change agent must understand the recipients, adjust minor procedures accordingly, and address participants' various stages of concern, the levels of use, and what the innovation looks like when fully implemented. To that end, the lesson plan design would include

- relevant facts supporting the need for a new lesson plan design,
- facts supporting the project as an answer for that need,
- how the participants would be trained in the lesson plan,
- bi-lateral conversations addressing participants' concerns,
- a time line for implementation,
- what implementation would look like when completed, and
- ideas regarding accountability.

Proposal for Implementation and Timetable

To aid teachers and administrators in implementing the project, the results would be organized and formatted to ensure effective presentation to local audiences, ease of access for teachers and administrators, and ease of use for stakeholders. A master report would summarize the problems at the local and district level, study methods, data collected for the study, analysis and results, and include recommendations. Further shorter reports would be prepared to connect the findings with specific needs of audiences, presentations, or personnel. Reports may be prepared on paper or electronically that focus on the data collected and analysis, the findings and recommendations, the tables and figures, an executive summary, or a narrative summary.

With the assistance of the Tiger Middle School principal and district level representatives, the findings would be reframed as recommendations for school and district improvement for policy makers. The timetable for complete implementation of the project would be November 2011 at Tiger Middle School and January 2012 district wide.

Roles and Responsibilities of Students and Others

There will be no responsibilities required for students at the local or district level. Responsibilities at the local level would include the administrative team endorsing the project, arranging the time for presentation sessions, and allowing opportunities for question and answer meetings. Responsibilities of the district level representatives at the local school would include assisting teachers with implementing the project in each classroom. Responsibilities of the focus walk group would be to evaluate the level of implementation in each classroom and determine if there is a need for additional assistance.

Project Evaluation

The evaluation of the lesson plan project would be goal-based in principle. The project evaluation would involve an ongoing process of using data from teachers' pre and posttest assessments and data from formative assessments collected during the focus walks. The first goal of the project would be to have every teacher in the school using the lesson plan to increase student achievement. Secondary outcomes-based goals would be to increase student achievement as determined by standardized test scores at the local level and district level. The justification for this evaluation is that the most influential

factor in increasing student achievement, in the school system, starts with the individual teacher. The only way to improve student achievement is to improve instruction. If the quality of lessons and instruction improve in each classroom, then it is highly likely that student achievement will increase. Overall evaluation of the project would be determined at regular intervals during the year using student achievement data, teacher feedback, and administrative observations.

All teachers would collect pre and posttest assessment data from a learning unit to determine the effectiveness of the project. If the data were readily available from recent units, those data would serve as the baseline for that teacher. If data were unavailable, then the teacher would collect pre and posttest assessment data from the current unit. As the data collected in this study were more than sufficient to meet a 95% confidence level, the data collected by each teacher would serve to personalize the project. The teachers, with local or district level help as needed, would review their pre and posttest assessment results before and after using the lesson plan design. As an aid to teachers, pre and posttest assessment data could be collected and analyzed to show any significant change.

Implications Including Social Change

Local Community

This project directly addresses the needs of the learners in the local community: Tiger Middle School is a low-SES middle school in a Title I school district, and the results of this study indicated that students whose teachers activated students' prior knowledge with cues and questions before using LFS outperformed the students whose teachers used LFS only. Students whose prior knowledge was activated outperformed

their peers to a statistically significant degree, $F(1, 863) = 35.398$, $p < .000$. This project was based on data collected from Tiger Middle School, analysis and findings of the data, research literature specific to students from low-SES environments, lesson plan design, prior knowledge, instructional strategies, teacher effectiveness, LFS, learning theory, constructivism, implementing change, and student achievement data. This project will help each teacher incorporate proven instructional strategies into their lesson designs, activate students' prior knowledge before proceeding with the main learning goal, and help increase student engagement and achievement overall.

This project is relevant to students because, as student engagement increases, students will be actively thinking about their prior knowledge, personal experiences, and unique histories. Students will be forming links and constructing personal meaning and understanding with that content; meaningful learning should occur. As learning deepens, students should retain content better, score higher on subject area summative assessments, increase their annual CRCT scores, and be better prepared for the next grade level. If this project is implemented countywide, ultimately on a cumulative basis, families should see increases in their child's interest and enjoyment in school, administrators should see improvements in overall school performance, students may stay in school longer, the high school dropout rate may decrease, and community partners should see a better educated work force.

Far-Reaching Implications

In the larger context, the lesson plan design provides a complement to the LFS model of instruction that would explicitly promote teachers activating their students'

prior knowledge before proceeding with the essential question in LFS and the main learning goal. All teachers, schools, districts, and states using the LFS model of instruction could implement the lesson plan sequence immediately. For new and veteran teachers previously unaware of effective instructional strategies, the lesson plan design provides a research-based, effective design and model for teachers to use for developing high-quality lessons and presenting high-quality instruction.

From an administrative perspective, the lesson design and APK/EQ grid could serve as a basis for reviewing teachers' instructional components and lesson design. Each school and school district's school improvement plan could incorporate the lesson plan design, as the project is applicable to all students, all grade levels, and all subject matters. As the 2014 NCLB deadline for all students reaching proficiency on standardized tests nears, even schools that have met annual student achievement goals in the past and are not in the needs improvement category will need to improve their student achievement results continually. In higher educational settings, the lesson plan design could provide teacher education institutions a means to train and equip new and future teachers to prepare and present high-quality instructional lessons. As Hanusheck and Rivkin (2010) noted, actions to improve the collective quality of teachers "could dramatically affect U.S. achievement" (p. 3).

Conclusions

This section provided an overall description and goals for the project as well as the rationale for the project design. The project is supported by the current literature on educational reform methods, teacher impact on students learning, effects of low-SES

environments and prior knowledge of students, quality lesson plan designs, and current student achievement data as indicated on standardized test scores for AYP as presented in this section. Included here was a full presentation of the project, an implementation plan including supports and barriers, and a proposed ongoing plan for evaluation. This section included local implications for students, teachers, administrators, and overall school performance; community implications for the local school district and improving dropout rates; state implications for schools needing to improve student achievement; national schools using the LFS model of instruction; and institutions of higher learning training future teachers. Section 4 provides reflections on the project, scholarship, importance of the project, recommendations, and implications for future research.

Section 4: Conclusion

Strengths and Weaknesses of the Project

The lesson plan design directly addresses the local and larger problems associated with students who attend low-SES schools; new or veteran teachers who need a more effective lesson plan design; administrators who need higher-quality instructional lessons; and all teachers, schools, and school districts currently using the LFS model of instruction. While this study was conducted at a low-SES middle school, the study was grounded in learning theory, best practices, proven strategies, and could be applicable to a larger audience, high-SES schools, and institutions of higher learning. The strength of this project is that it is a flexible design and that all teachers, in all schools, for all students, in all grade levels, for all subject matters can apply the design. I recommend that the local school, school district, and schools using the LFS model of instruction implement the lesson plan design immediately.

The limitations of this study are that it provides only one basis for high-quality lesson. Not all nine proven instructional strategies are directly included in the project itself, and, as researchers indicated, teachers have to have command of many strategies and then use them at the appropriate time for the appropriate learning goals for the appropriate students. Further, as researchers pointed out, teachers could have the knowledge and ability of effective instruction, but still not use that knowledge.

Alternative Solutions

An alternative solution to address the problem would be for teachers to use their own method to activate students' prior knowledge before proceeding to the main portion

of the lesson. Given some training on the difference between activating students' prior knowledge, an activating strategy for the lesson, or an essential question to build interest, teachers could ensure that students' prior knowledge is incorporated and students are engaged before proceeding with the main learning goal; teachers could then use their regular lesson design. If teachers are currently using ineffective lesson plans or do not incorporate effective strategies, then simply activating a student's prior knowledge would not be as effective as activating a student's prior knowledge with an effective lesson plan design.

Another alterative solution to the local and large-scale problem would be to conduct an in-depth, substantial program evaluation of the LFS model of instruction. The study would have to be broad enough to cover the thousands of institutions using the model so that an accurate data analysis could be conducted. An evaluation in itself would not improve classroom instruction. Findings would need to be presented with a focus on practical application to the individual classroom setting, and results would need to be disseminated quickly. If additional training were necessary, sessions would need to be prepared immediately. As seen in this limited study, the LFS model was not effective after 8 years with trained staff (see Table 1).

Process, Scholarship, Research, and Project

The process of preparing a doctoral project study was similar to conducting a practical experiment where a problem was noted and verified, a means to correct the problem was determined, the strategy was applied to the problem, and then an evaluation was conducted to determine the results. A doctoral study is different in that the

researcher must base the local problem, correction strategy, implementation, and evaluation of the work in the scholarly literature and theory. As researchers use the literature to support their work, then literature builds literature and scholarship builds scholarship. Scholarship is interconnecting previous results with current issues helping future researchers.

During this study on effective teaching strategies for low-SES students, the literature was substantial in most areas and highly interconnected; in other areas, the literature was unusually limited. Having access through the Internet to vast numbers of databases that contain millions of electronic books, journals, and articles from scholars from around the world allowed unprecedented reviews and analysis of the literature to determine what researchers have done, what researches are doing, and what researchers suggest should be done. Conducting research for this project helped ground and place this study into the scholarly body of knowledge.

Using the results from the data analysis and the literature reviews determined the idea, structure, and format of the lesson plan project. The data analysis provided precise results for teacher effectiveness, teacher differences, and the effectiveness of the LFS model of instruction. The data analyses results clearly depict what was previously unknown regarding the effect of activating students' prior knowledge before using LFS. The literature supported that there were, in fact, effects of low-SES environments on student achievement, student-level factors accounted for the majority of determinants for student achievement, researchers have determined effective instructional strategies, and effective teacher can make a substantial difference in a child's life.

Self-Reflection

I was called to be a teacher while still in high school and pursued that calling with focus. After receiving appropriate training and proper credentials, I began teaching with great enthusiasm and effectiveness. After a series of unpleasant experiences with the educational system—not the students—I left teaching. As can be seen in the curriculum vitae, I kept busy doing valuable work for others, but I was unsettled. While being in a superb job, in an ideal location, I was completely miserable; I returned to teaching determined to do what I was called to do. Through this study, I verified some things I had long suspected: effective teachers do make a difference, there are some instructional strategies that work better than others do, and teaching is an interactive process with people not content. I teach children, not math, science, or music. Through this study, I learned and verified as a practitioner that using better instructional strategies did improve student achievement not just in theory, but also in reality. Using better strategies produces better results. I had suspected that a student's prior knowledge and home environment accounted for part of the learning process, but I was surprised that the student-level factors were as large as the literature repeatedly indicated. I was glad to verify that effective teachers can offset some of the low-SES effects. I had previously thought that the gaps in achievement between low- and high-SES students were due solely to ineffective teachers, but now see that low-SES factors are more pervasive and detrimental than just family economics. Through the literature reviews and the data analysis results, I now see that all new learning is based on prior learning and how critical it is to activate prior knowledge for all students.

During this study and development of the project, I learned that scholarly work is based on saturation and simplicity. I used my detail, organizational, and system skills to read and reflect on what scholars have written and how they wrote it—not only in content but also in word choice. Scholars produce carefully researched ideas and results with thoughtful clarity and unbiased perspectives. In this study, I tried to reflect a scholarly approach and voice that paralleled the substance and style that I read in the literature.

I have always been adept with the details of project development, but for this study, I was bound by the format and scholarly literature to present all sides of the problem, findings, solutions, and include details I would have typically omitted. I give extensive presentations multiple times each year to large audiences and I usually choose the entire content of the presentations. In developing this project, I was surprised to learn that alternative views and opposing findings can strengthen a final presentation.

Importance of the Project

I think the results of this project study are critical to the scholarly body of knowledge in the literature and should be distributed as widely as possible. The results of this study can be the basis for further research for effective teaching strategies, using the LFS model of instruction, and teaching in a low-SES middle school. This project study could be the basis for researchers to verify, correct, or augment the results found regarding the effectiveness the LFS model of instruction. The results of this project study could be disseminated to administrators and teachers on a national scale and provide support that the idea of activating a student's prior knowledge in every classroom every day should be implemented immediately.

A guiding premise for this project design was that nothing could improve student achievement quicker than improving a teacher's instruction. All teachers have the individual responsibility of preparing and presenting high-quality instruction to all of their students all of the time. It is my hope that this lesson design will aid all teachers in all subject matters in all grade levels to develop high-quality lessons for the betterment of their students.

Appendix A: Doctoral Study Project

Table of Contents

Lesson Plan Sequence

Introduction

Effective learning begins with effective teaching.

This project was a result of reflecting on the lack of substantial improvement in standardized test scores at my low-SES middle school after 8 years of using a model of instruction designed to help schools just like mine. My school district uses the same lesson plan design throughout the county, but not all schools are successful in increasing student achievement as measured by standardized test scores used in determining adequate yearly progress (AYP). Most of the high-SES schools make AYP; many of the low-SES schools regularly fail AYP. If the lesson plan design is effective for all students, why was my school continuing to fail AYP and other schools were passing? Did the other schools have better teachers? Were the higher-SES students smarter than our students? Our county uses this model of instruction because it was supposed to provide an equal education to all, but we were not having equal education in our county. Something must be wrong…

The purpose of this project was to correct the deficit of our current model of instruction by activating students' prior knowledge before proceeding with the main learning goal. This simple instructional strategy of activating prior knowledge is the foundation for all learning for all students of all grade levels in all subject matters—but especially for low-SES students who may come to school with less prior knowledge than their higher-SES peers. Activating prior knowledge for low-SES students is critical to increasing student achievement as supported by the ANCOVA results in my doctoral study $F(1, 863) = 35.398$, $p < .000$.

A significant amount of research supports not only the sequence of the lesson plan, but also the need for setting expectations for learning and behavior *each day* for the students. The design and sequence of the lesson plan introduction is structured so that the teacher can:

- relate the current learning goal to the state-mandated curriculum standard,
- associate that standard to the new learning goal,
- explicitly and intentionally link the new content to students' prior knowledge,
- explain how the students would learn the new material,
- set forth student expectations for learning and behavior,
- provide the students with an outline of the class period, and
- use effective instructional strategies.

The audience for this sequenced introduction is anyone who needs to teach someone something. The design is prepared primarily for classroom teachers, but is adaptable for private tutors remediating or extending student learning, teacher aids in small group instruction, or persons making professional development presentations.

To make the best use of the lesson plan design, the instructor should gather the standards, learning goal(s) (objective), activities to help the students learn the concepts or skills, and think about not only the subject matter prior learning, but also what the students may bring with them to the class from their personal histories. The best way to know how a student's personal history could be applicable to the current lesson is to ask them!

Teacher: "Baroque music is very ornate… (hum, not a great word for 8th graders)… very elaborate… (not much better)… fancy… (that's not very good either… how can they relate to this?) How would *you* say it?"

Student: "Like a gold mirror!"

Teacher: "Yes! Just like a fancy gold mirror with all the stuff around the edges! Baroque music is fancy, like a gold mirror!"

Other elements for effective instructional strategies include *frequent* formative assessments during class, checking for student understanding, gaps in learning or misunderstandings, having the students identify similarities, differences, and relationships of the new material with previous material/concepts/skills, and having *the students* summarize what they have learned. As Marzano (2003) said succinctly, "Effective teachers use more effective instructional strategies" (p. 78).

Part of my motivation for this project stemmed from a simple question and answer prompt:

"How do you find an effective teacher?

Look for effective learning."

In reflecting on the current educational atmosphere, I concluded teachers are highly certified, highly qualified, or highly effective. Which do you want to be?

Respectfully,

Glenn Cason, Ed.D.

References: Marzano, R. J. (2003). *What works in schools: Translating research into action*. Alexandria, VA: Association for Supervision and Curriculum Development.

How to Use the Lesson Plan Sequence

Lesson Planning

The teacher should

- have a clear idea of the main learning goal for the lesson: what the students should learn, do, experience, improve, or how the student should be changed when the lesson is over,
- gather the curriculum standard(s) that applies to the lesson and specify what is the main learning goal or objective for the lesson,
- decide on the essential question for the lesson,
- plan for all instructional materials and decide on specific activities necessary to help the students accomplish the main learning goal,
- list all associated prior knowledge for the topic and speculate how students may have personal histories that could be included,
- specify ways for students to identify similarities and differences,
- determine what formative assessments would be beneficial to check for student understanding,
- plan for a summarizing activity that the students can generate, and
- identify what elements of the lesson will be posted on the board.

Lesson Script

The teacher should

- use the Lesson Plan Sequence to Activate Students' Prior Knowledge Format page to begin structuring the introduction to the lesson,
- associate and fill in the planned lesson elements with the appropriate alphabetical ("a" through "m") marker in the lesson plan sequence, and
- reword the script to personalize the word choice for that particular lesson but maintain the lesson plan sequence.

Lesson Introduction

The teacher should

- post the lesson outline on the board before class begins,
- use the lesson plan script and refer to the lesson outline to introduce the main learning goal(s) to the students, and
- refer to the posted outline to guide, manage, or redirect students through the lesson.

Lesson

The teacher should

- use formative assessments to gauge students' understanding of the material
- review lesson elements as needed,
- remind students of expectations for behavior, transitions, interactions, or special items that pertain to the lesson as needed, and
- pace the lesson so that in the main learning goal(s) there is an intentional link to, connection with, and building from students' prior knowledge.

Lesson Plan Sequence to Activate Students' Prior Knowledge: Plan

Let's start class by looking at your standards. Today you're going to work on standard _____. Let's read the definition together. (Read definition). That standard means that you're going to learn about _____ (state in simple terms). You're going to be learning about that standard by working on _____ (specific activity). While you're working on _____ (activity), remember to keep demonstrating correct _____ (other standards, skills, knowledge, etc.) from standard(s) _____.

Today's learning goal is _____ (short and specific). Do you remember that we studied _____ the other day? Who can tell me what that was about? (Student input). What else do you remember? (Student input). Anything else? (Student input). (The teacher is to keep prompting or asking questions until the students have recalled all the points have been led to the day's main learning goal.) Well, today is an extension of that because _____ (state the learning goal) is just _____ (tell how learning goal is related to prior knowledge). At the end of the lesson, I'd like you to be able to answer _____ (essential question).

I'd like for you to _____ (explicit directions and expectations for students' behavior or participation for class). To accomplish the learning goal, we're going to _____ (activating strategy, warm up) first, then work on the _____ (concept, skill) next, and finish up with _____ (summarizing activity).

Lesson Plan: Detail

Standard Association

Let's start class by looking at your standards. Today you're going to work on standard _____. Let's read the definition together. (Read definition). That standard means that you're going to learn about _____ (state in simple terms). You're going to be learning about that standard by working on _____ (specific activity). While you're working on _____ (activity), remember to keep demonstrating correct _____ (other standards, skills, knowledge, etc.) from standard number _____.

Learning Goal

Today's learning goal is _____ (short and specific).

Activate Prior Knowledge

Do you remember that we studied _____ the other day? Who can tell me what that was about? (Student input). What else do you remember? (Student input). Anything else? (Student input). (The teacher is to keep prompting or asking questions until the students have recalled all the points have been led to the day's learning goal.) Well, today is an extension of that because _____ (state the learning goal) is just _____ (tell how learning goal is related to prior knowledge).

Set forth expectations

At the end of the lesson, I'd like you to be able to answer _____ (essential question). I'd like for you to _____ (explicit directions and expectations for students' behavior or participation for class).

Lesson

To accomplish the learning goal, we're going to _____ (activating strategy, warm up) first, then work on the _____ (concept, skill) next, and finish up with _____ (summarizing activity).

During the Lesson

Formative assessments. During the lesson, the teacher frequently verbally and visually checks for understanding and may use formative assessments. Students must be mentally engaged in the lesson and not just busy doing activities or work.

Identify similarities, differences, and relationships. During the lesson and learning activities, the teacher should have the students identify how the different elements for activities of the lesson are similar, different, and/or relate not only to each other, but also to prior knowledge, prior lessons, or prior standards.

State practice time or homework opportunities. The teacher should allow for specific in-class individual practice and/or state specific items to practice at home for the students to practice in a self-paced environment and explore the content on their own.

State means for acquiring and maintaining an orderly classroom. The teacher should state expectations for student behavior during the class, making transitions, and for ending class.

Lesson Plan: Components

- Specific lesson plan and intentionality for the learning material,
- Specific curriculum standard,
- Specific learning goal,
- Specific learning activities,
- General and specific prior standards,
- Specific strategy to activate students' prior knowledge,
- Specific essential question,
- Specific explicit directions,
- Specific learning activity structure (beginning, middle, end),
- Specific identify similarities, differences, and relationships;
- Specific practice time or homework assignments;
- Specific directions for an orderly classroom;
- General language that is easy to understand.

Research-based Support Summarized

- Expectations for the behavior, learning goals, participation, and demonstration of learning must be clear to the teacher before the lesson begins then clearly and directly communicated to the students. The teacher has intentionality in the lesson.
- Learning goals (concepts, skills, and/or relationships) must be specific and directly linked to prior knowledge.
- Students' prior knowledge must be activated before proceeding with the instructional component.
- As part of the learning activities, teacher incorporates identifying similarities, differences, and relationships between new content and prior knowledge.
- The teacher uses data and formative assessments to gauge student understanding.
- Practice time and specific homework provides self-pacing and exploring the required concepts and skills.

On the Board

The teacher should provide a visual outline of the lesson in an area where each student can see. The outline should contain:

1. Standard for the day
2. Learning goal
3. Prior Knowledge (PK)
4. Essential Question (EQ)
5. Learning activities
    a. Warm up
    b. Learning and practicing activities
    c. Summarizing activities
6. Homework or practice assignments

On the Board: Sample

2/29/11

Standard	Number 6: Demonstrates the ability to perform individually, in small groups, and as a member of the total ensemble.
Learning goal	Play in a trio
Prior knowledge	Posture, embouchure, air stream, tonguing, and key signatures
EQ	"What are the biggest similarities or differences you notice when playing a trio compared to playing as a full band or duet?"
Activities	#86-88; review new notes; #131; discussion
Homework	#131 lines A, B, and C

APK/EQ Lesson Plan Grid

Period	Monday	Tuesday	Wednesday	Thursday	Friday
1	APK: EQ:	APK: EQ:	APK: EQ:	APK: EQ:	APK: EQ:
2	APK: EQ:	APK: EQ:	APK: EQ:	APK: EQ:	APK: EQ:
3	APK: EQ:	APK: EQ:	APK: EQ:	APK: EQ:	APK: EQ:
4	APK: EQ:	APK: EQ:	APK: EQ:	APK: EQ:	APK: EQ:
5	APK: EQ:	APK: EQ:	APK: EQ:	APK: EQ:	APK: EQ:
6	APK: EQ:	APK: EQ:	APK: EQ:	APK: EQ:	APK: EQ:

The 9 Most Effective Instructional Strategies (Marzano, 2003, p. 80)

1. Identifying similarities and differences
2. Summarizing and note taking
3. Reinforcing effort and providing recognition
4. Homework and practice
5. Nonlinguistic representations
6. Cooperative learning
7. Setting objectives and providing feedback
8. Generating and testing hypotheses
9. Questions, cues, and advance organizers

References: Marzano, R. J. (2003). *What works in schools: Translating research into action*. Alexandria, VA: Association for Supervision and Curriculum Development.

Lesson Plan Sequence to Activate Students' Prior Knowledge
(grade, subject, course, or class period)

Format

Let's start class by looking at your standards. Today you're going to work on standard (a). Let's read the definition together. (Read definition). That standard means that you're going to learn about (b) (state in simple terms). You're going to be learning about that standard by working on (c) (specific activity). While you're working on (c) (activity), remember to keep demonstrating correct (d) (other standards, skills, knowledge, etc.) from standard number(s) (e).

Today's learning goal is (f) (short and specific). Do you remember that we studied (g) the other day? Who can tell me what that was about? (Student input). What else do you remember? (Student input). Anything else? (Student input). (The teacher is to keep prompting or asking questions until the students have recalled all the points that have led to the day's learning goal.) Well, today is an extension of that because (f) (state the learning goal) is just (h) (tell how learning goal is related to prior knowledge). At the end of the lesson, I'd like you to be able to answer (i) (state essential question).

I'd like for you to (j) (explicit directions and expectations for students' behavior, transitions, or participation for class). To accomplish the learning goal our goal for the day, we're going to (k) (activating strategy, warm up) first, then work on the (l) (concept, skill) next, and finish up with (m) (summarizing activity).

a.

b.

c.

d.

e.

f.

g.

h.

i.

j.

k.

l.

m.

Lesson Plan Sequence to Activate Students' Prior Knowledge
5th and 6th Period: 6th Grade Beginning Band

Plan

Let's start class by looking at your standards. Today you're going to work on standard (a). Let's read the definition together. (Read definition). That standard means that you're going to ~~learn about~~ (b) (state in simple terms). You're going to be learning about that standard by working on (c) (specific activity). While you're working on (c) (activity), remember to keep demonstrating correct (d) (other standards, skills, knowledge, etc.) from standard number(s) (e).

Today's learning goal is (f) (short and specific). Do you remember that we studied (g) the other day? Who can tell me what that was about? (Student input). What else do you remember? (Student input). Anything else? (Student input). (The teacher is to keep prompting or asking questions until the students have recalled all the points that have led to the day's learning goal.) Well, today is an extension of that because (f) (state the learning goal) is just (h) (tell how learning goal is related to prior knowledge). At the end of the lesson, I'd like you to be able to answer (i) (state essential question).

I'd like for you to (j) (explicit directions and expectations for students' behavior, transitions, or participation for class). To accomplish ~~the learning goal~~ our goal for the day, we're going to (k) (activating strategy, warm up) first, then work on ~~the~~ (l) (concept, skill) next, and finish up with (m) (summarizing activity).

a. number 6. "Demonstrates the ability to perform individually, in small groups, and as a member of the total ensemble."
b. show me you know how to play as a full band and in a small band.
c. #131, Kum Bah Yah, which is a trio.
d. posture, embouchure, tonguing, and playing in the right key.
e. 1, 2, 3, and 10
f. to learn how to play as a trio.
g. duets and playing as a soli group
h. a little smaller than a soli group and a little bigger than playing a duet
i. "What are the biggest similarities or differences you notice when playing a trio compared to playing as a full band or duet?"
j. sit quietly and listen carefully when the trio groups are playing so you can critique their performance
k. warm up on #86-88 and review the new notes
l. sight reading and learning the notes and rhythms of #131, then practice playing in small groups and trios
m. describing what you noticed when you played as a trio group and what you heard when others played

Lesson Plan Sequence to Activate Students' Prior Knowledge
5th and 6th Period: 6th Grade Beginning Band

Lesson Introduction

Let's start class by looking at your standards. Today you're going to work on standard number 6. Let's read the definition together. "Demonstrates the ability to perform individually, in small groups, and as a member of the total ensemble." That standard means that you're going to show me you know how to play as a full band and in a small band. You're going to be learning about that standard by working on #131: Kum Bah Yah, which is a trio. While you're working on #131, remember to keep demonstrating correct posture, embouchure, air stream, tonguing, and playing in the right key from earlier standard numbers 1, 2, 3, and 10.

Today's learning goal is to play as a trio. Do you remember that we studied duets, and playing as a soli group the other day? Who can tell me what that was about? ("Duets are when 2 people play.") What else do you remember? ("A soli is when your section plays."). Anything else? ("A soli doesn't have an exact size; it can be all the first chair players or the whole clarinet section.") (The teacher is to keep prompting or asking questions until the students have recalled all the points that have led to the day's learning goal.) Well, today is an extension of that because playing in a trio is just a little smaller than a soli group and a little bigger than playing in a duet. At the end of the lesson, I'd like you to be able to answer the essential question, "What are the biggest similarities or differences you notice when playing a trio compared to playing as a full band or duet?"

I'd like you to sit quietly and listen carefully when the trio groups are playing so you can critique their performance. To accomplish our goal for today, we're going to warm up on #86-88 and review the new notes first, then work on sight reading and learning the notes and rhythms of #131, then practice playing in small groups and trios next, and finish up with describing what you noticed when you played as a trio group and what you heard when others played.

Lesson Plan Design Sequence to Activate Students' Prior Knowledge
6th Grade NBI Math

Plan

Let's start class by looking at your standards. Today you're going to work on standard (a). Let's read the definition together. (Read definition). That standard means that you're going to learn about (b) (state in simple terms). You're going to be learning about that standard by ~~working on~~ (c) (specific activity). While you're working on (c) (activity), remember to keep demonstrating correct (d) (other standards, skills, knowledge, etc.) from standard number(s) (e).

Today's learning goal is (f) (short and specific). Do you remember ~~that~~ when we studied (g) the other day? Who can tell me what that was about? (Student input). What else do you remember? (Student input). Anything else? (Student input). (The teacher is to keep prompting or asking questions until the students have recalled all the points have been led to the day's learning goal.) Well, today is an extension of that because (f) (state the learning goal) is just (h) (tell how learning goal is related to prior knowledge). At the end of the lesson, I'd like you to be able to answer (i) (state essential question).

I'd like for you to (j) (explicit directions and expectations for students' behavior, transitions, or participation for class). To accomplish the learning goal, we're going to (k) (activating strategy, warm up) first, then work on ~~the~~ (l) (concept, skill) next, and finish up with (m) (summarizing activity).

a. M6A3: students will solve simple one-step equations using each of the four basic operations
b. Finding the value of "X"
c. creating and solving an equation from a short word problem.
d. Math skills for inverse operations and building your knowledge through problem solving
e. M6P1
f. Use letters to represent numbers
g. Using math to represent problems
h. Where we may not know all of the parts of the problem and we have to use an alphabet letter, or variable – like X – to solve the problem.
i. Why do we use letters to represent numbers?
j. Write each step out on your paper, show all of your work for each problem, and circle your answer. At the end of class, please give me your paper so I can review it.
k. Review inverse operations
l. Creating an equation, then solving the one-step equation
m. A group discussion of why variables are used and how they may be helpful in finding solutions to some everyday problems.

Lesson Plan Design Sequence to Activate Students' Prior Knowledge
6th Grade NBI Math

Lesson Introduction

Let's start class by looking at your standards. Today you're going to work on standard M6A3. Let's read the definition together: "students will solve simple one-step equations using each of the four basic operations." That standard means that you're going to learn about finding the value of "X." You're going to be learning about that standard by ~~working on~~ creating and solving an equation from a short word problem. While you're working on the word problems, remember to keep demonstrating correct math skills for inverse operations ~~from standard number(s) (e).~~

Today's learning goal is use letters to represent numbers. Do you remember ~~that~~ when we studied using math to represent problems the other day? Who can tell me what that was about? ("Math can represent buying things at the store.") What else do you remember? ("Word problems can be things from our lives.") Anything else? ("Subtracting is the opposite of adding.") (The teacher is to keep prompting or asking questions until the students have recalled all the points that have led to the day's learning goal.) Well, today is an extension of that because using letters to represent numbers is just where we may not know all of the parts of the problem and we have to use an alphabet letter, or variable – like X – to solve the problem. At the end of the lesson, I'd like you to be able to answer, "Why do we use letters to represent numbers?"

I'd like you to write each step out on your paper, show all of your work for each problem, and circle your answer. At the end of class, please give me your paper so I can review it. To accomplish the learning goal, we're going to review inverse operations first, then work on ~~the~~ creating an equation, then solving a one-step equation next, and finish up with a group discussion of why variables are used and how they may be helpful in finding solutions to some everyday problems.

Lesson Plan Design Sequence to Activate Students' Prior Knowledge
1st and 2nd Period: 6th Grade ELA

Plan

Let's start class by looking at your standards. Today you're going to work on standard (a). Let's read the definition together. (Read definition). That standard means that you're going to learn about (b) (state in simple terms). You're going to be learning about that standard by ~~working on~~ (c) (specific activity). While you're working on (c) (activity), remember to keep demonstrating correct (d) (other standards, skills, knowledge, etc.) from standard number(s) (e).

Today's learning goal is (f) (short and specific). Do you remember that we studied (g) the other day? Who can tell me what that was about? (Student input). What else do you remember? (Student input). Anything else? (Student input). (The teacher is to keep prompting or asking questions until the students have recalled all the points that have led to the day's learning goal.) Well, today is an extension of that because (f) (state the learning goal) is ~~just~~ (h) (tell how learning goal is related to prior knowledge). At the end of the lesson, I'd like you to be able to answer (i) (state essential question).

I'd like for you to (j) (explicit directions and expectations for students' behavior, transitions, or participation for class). To accomplish the learning goal, we're going to (k) (activating strategy, warm up) first, then work on ~~the~~ (l) (concept, skill) next, and finish up with (m) (summarizing activity).

a. ELA6W4
b. How to start and finish a writing project
c. Pre-writing for a persuasive essay on, "Should movie stars or athletes be considered role models?"
d. Interactions with me and other students, and give me a reason behind your answers
e. ELA6LSV1
f. Practice pre-writing techniques
g. Persuasive writing and the steps to writing
h. Is where you begin when writing an essay
i. "How does pre-writing help you form an effective persuasive essay?"
j. Work by yourself and be very quiet so that everyone can concentrate.
k. Free write about the topic for 5 minutes
l. Looping and brainstorming for 10 minutes each
m. Clustering and discussion

Lesson Plan Design Sequence to Activate Students' Prior Knowledge
1st and 2nd Period: 6th Grade ELA

Lesson Introduction

Let's start class by looking at your standards. Today you're going to work on standard ELA6W4. Let's read the definition together: "The student consistently uses the writing process to develop, revise, and evaluate writing." That standard means that you're going to learn about how to start and finish a writing project. You're going to be learning about that standard by ~~working on~~ pre-writing for a persuasive essay on, "Should movie stars or athletes be considered role models?" While you're working on your persuasive essay, remember to keep demonstrating ~~correct~~ appropriate interactions with me and other students, and give me a reason behind your answers from standard ~~number(s)~~ ELA6LSV1.

Today's learning goal is practice pre-writing techniques. Do you remember that we studied persuasive writing and the steps to writing the other day? Who can tell me what that was about? ("Persuasive writing is when you're trying to convince somebody of something.") What else do you remember? ("You have to prove your point.") Anything else? ("You have to get ideas, make a draft, and edit the essay before you turn it in.") (The teacher is to keep prompting or asking questions until the students have recalled all the points that have led to the day's learning goal.) Well, today is an extension of that because pre-writing is ~~just~~ step 1 for writing a good essay. At the end of the lesson, I'd like you to be able to answer, "How does pre-writing help you form an effective persuasive essay?"

I'd like you to work by yourself and be very quiet so that everyone can concentrate. To accomplish the learning goal, we're going to free write on the topic for about 5 minutes first, then work on ~~the~~ looping and brainstorming for about 10 minutes next, and finish up with clustering and a group discussion.

Appendix B: Pretest Assessments

Every teacher in the study prepared a pre and posttest assessment to gauge the knowledge acquisition of each student for that specific learning unit. The learning unit was determined by which week of the school year the content was to be taught according to the curriculum mapping of the Georgia Performance Standards. Samples of the pre and posttest assessments are included from seventh-grade English Language Arts, eighth-grade mathematics, eighth-grade science, and sixth-grade math. The teachers scored each student's pretest, taught the unit of study for the prescribed number of weeks, and then gave the same assessment as the posttest. The pretest and posttest scores were recorded in the online grade book and used as data in this study.

MAIN IDEA & SUPPORTING DETAILS TEST Name: _____

I. Read the following passages, and select the answer for each that best summarizes the main idea of that paragraph. Fill in the blank with the correct answer for each.

1. Every year in Hollywood there is a contest for people who perform stunts. The contest has three main events. In the horse event, the stunt people must make their horses fall. Then they jump on other horses and race down a long trail. In the motorcycle event, people race eight laps around a dirt track. In the last event, they race around the dirt track in cars.

_____ The passage mainly tells….
a. How Hollywood gets money
b. How motorcycles are raced
c. What a stunt contest is like
d. When dirt track racing began

2. You dream each night, even though you may not remember your dreams. While you dream your eyes move and your heart beats faster. Even your brain-wave pattern changes when you dream. Some scientists think that dreaming is important for the sake of health. They claim that without dreams, people would go crazy.

_____ The passage mainly tells….
a. How people stay healthy by dreaming
b. How sleep is necessary to stay healthy
c. Why dreams are important
d. Why people do not remember dreams

3. Cats are very hard to train, but some people have figured out how to do it. The secret is that a cat's brain is in its stomach. All you need is cat food, a spoon, and plenty of time! Put some food on the spoon and hold it wherever you want the cat to go. The cat will learn to obey your hand motions, even when there isn't any food.

_____ The passage mainly tells….
a. How to teach an old dog new tricks
b. Where the parts of a cat are located
c. How to train a cat
d. The difference between cats and dogs

II. Which details do not belong? Select a detail for each main idea that does not support that main idea.

4. Main idea: Holidays in the United States often offer opportunities for family members to get together, eat, and spend time with each other.

_____ a. Caramel apples and popcorn balls are usually considered Halloween treats.
b. Thanksgiving is a busy time at airports, because so many people fly home to eat turkey dinner with their families.
c. Christmas is a time for getting together with family and friends to share food and gifts.
d. On Easter, grandparents, parents, and children usually attend church together and often share an afternoon filled with food and fellowship.

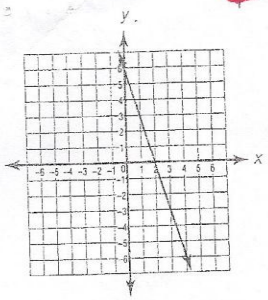
5. Main Idea: Cell phones are convenient communication devices, but they can also be dangerous.

_____ a. A lot of people cause automobile accidents when they talk on cell phones while driving.
b. Verizon, Sprint, AT&T, and T-Mobile are all cell phone providers.
c. A child was recently hit at a bus stop in Atlanta because she was talking on her cell phone and not paying attention to traffic.
d. On rare occasions, cell phone users have been burned by cell phones catching fire.

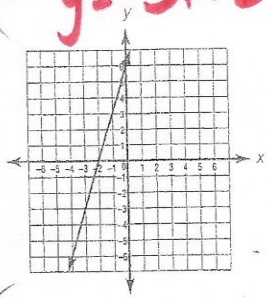
Which is the graph of $y = -3x + 6$?

$y=-3x+6$

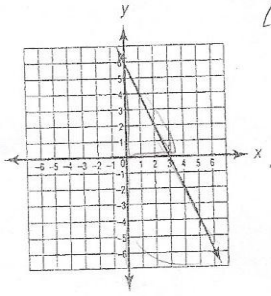
A.



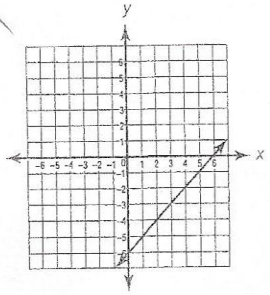
C.



B.



D.

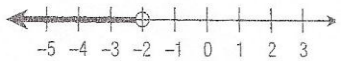


25 graph the ... inequality?

$$2x + 28 \leq 24$$

A.

B.



C.

D.

26 Solve: $\frac{x}{5} + 20 > 30$

A. $x > 2$

B. $x < 50$

C. $x > 50$

D. $x < 550$

27 Solve: $-9n + 8 \geq 80$

A. $n \geq 8$

B. $n \leq 8$

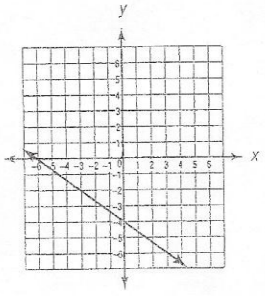
C. $n \geq -8$

D. $n \leq -8$

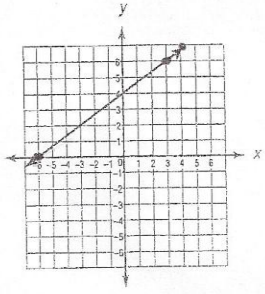
24

Which is the graph of $-2x + 3y = 12$?

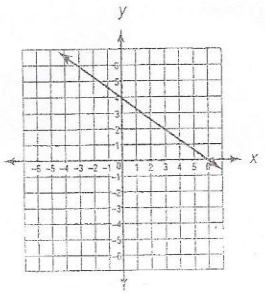
A.



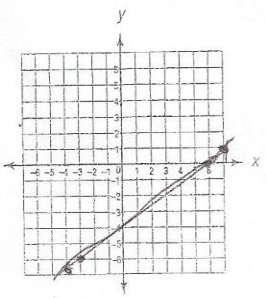
C.



B.



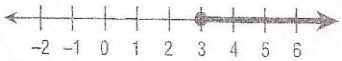
D.



28 Which graph shows the solution of this inequality?

$$4x - 5 > 7$$

A.



B.

C.

D.

Name: _____ Class: _____ Date: _____

Thinking with Mathematical Models Unit Test

Multiple Choice
Identify the choice that best completes the statement or answers the question.

Solve the equation.

1. $6x + 29 = 5$
   a. -18 b. -4

2. $-9p - 17 = 10$
   a. -3 b. 18

3. $12k = 108$
   a. 1,296 b. 96 c. 9 d. 120

Write and solve an equation.

4. You withdrew \$100 from the ATM machine. The new balance is \$372. What was the original balance b of your account?
   a. $b - 100 = 372$; \$472 b. $b + 372 = 100$; \$272

5. Mark wants to buy a skateboard that costs \$65. He plans to save \$5 per week. How many weeks w will it take him to save \$65?
   a. $5w = 65$; 13 weeks b. $\frac{w}{5} = 65$; 13 weeks

6. List the terms that correctly complete the table.

Time (seconds)	0	1	2	3	4	5	6	7	8	9
Distance (feet)	▩	30	40	50	▩	70	80	90	100	▩

   a. 20, 60, 110 b. 20, 60, 113

7. The cost of a school banquet is \$90 for the room rental and \$14 per person attending. Write an expression to model the total cost of the banquet for p people. What is the cost for 70 people?
   a. $90 + 14p$; \$1,070 b. $90p + 14$; \$1,070

8. What is the equation of the line that passes through the points $(1, -1)$ and $(3, -7)$?
   a. $y = 3x + 2$ b. $y = -2x + 1$ c. $y = -3x + 1$ d. $y = -3x + 2$

15 What is the slope of the line $y = \frac{1}{2}x - 2$?

A. -2

B. $-\frac{1}{2}$

C. $\frac{1}{2}$

D. 2

16 What is the y-intercept of the line $y = 6x + 11$?

A. 0

B. 6

C. 11

D. 66

17 What is the slope of the line $y - 4x = 10$?

A. -10

B. -4

C. 4

D. 10

18 What is the y-intercept of the line $y + 3x = -1$?

A. -3

B. -1

C. 1

D. 3

19 A line passes through points at (4, 4) and (−3, −2). Find its slope.

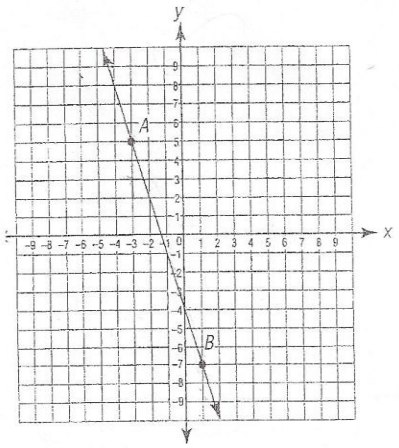
D. $\frac{6}{7}$

A. 6

B. $\frac{6}{7}$

C. 2

20 What is the slope of the line that passes through points A and B?



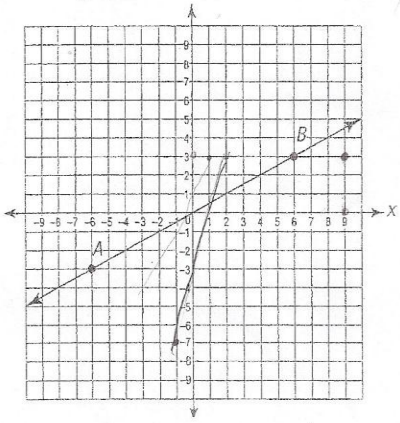
A. $-\frac{1}{3}$

B. $-\frac{1}{2}$

C. -2

D. -3

21 Find the slope of the line that passes through points A and B.



A. $\frac{1}{2}$

B. 1

C. 2

D. 6

22 A line passes through points at (3, 9) and (4, 15). What is its slope?

D. 6

A. $\frac{1}{6}$

B. $\frac{6}{7}$

C. $\frac{7}{6}$

9 What is true about the lines $y = 7x - 10$ and $y = 7x + 10$?

A. They intersect at one point.
B. They intersect at no points.
C. They are really the same line.
D. They are perpendicular lines.

10 Which equation has a slope of -2 and passes through the point $(5, 0)$?

F. $y = 2x + 5$
G. $y = 2x + 10$
H. $y = -2x + 5$
J. $y = -2x + 10$

11 What is the slope of the line that passes through the points $(0, 3)$ and $(8, 4)$?

A. 3
B. $\frac{4}{5}$
C. $\frac{1}{8}$
D. 8

12 What is the equation of the line that passes through the points $(1, -1)$ and $(3, -7)$?

F. $y = 3x + 2$
G. $y = -2x + 1$
H. $y = -3x + 1$
J. $y = -3x + 2$

13 Which of the following is *not* enough information to find the equation of a line?

A. The slope and y-intercept
B. The slope and one point on the line
C. The equation of a parallel line
D. Two points on the line

14 Which of the following equations would best model the data table below?

x	2	3	4	5	6	7	8	9	10
y	5	8	9	11	13	15	17	21	21

F. $y = 2x + 1$ G. $y = 2x$ H. $y = 2x + 5$ J. $y = \frac{2}{x}$

III. Read the following paragraphs, and fill in the diagrams below with a main idea and supporting details for each.

Various cultures around the world have different myths explaining the origin of fire. According to Hawaiian legend, Pele, the goddess of fire, lived in the volcano Kilauea and her jealous rages were believed to cause volcanic eruptions. An old Apache legend states that fire was discovered when a fox outwitted a village of fireflies and scattered fire around the earth. According to African folklore, the god Tore and his mother, Matu, possessed fire until the day it was stolen from them by a magician, Doru, and given to all the African people. In Greek mythology, Prometheus gave fire to mankind by lighting a torch from the sun god Apollo's chariot as it passed through the morning sky.

MAIN IDEA

S. DETAIL

S. DETAIL

S. DETAIL
Fire was discovered when a fox outwitted a village of fireflies according to Apache legend.

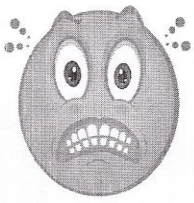
S. DETAIL

People suffer from many kinds of fears or phobias. Some people are acrophobic, because they fear heights. Others have agoraphobia which means they dread entering wide-open places. A great number of people are claustrophobic and afraid of being closed into small spaces. Many have arachnophobia as a result of a frightening encounter with a spider. Dirt and germs cause mysophobic individuals to become very upset. While many people love dogs and cats, those who suffer from zoophobia are afraid of almost all animals.

MAIN IDEA

S. DETAIL

S. DETAIL



S. DETAIL

S. DETAIL
People who are afraid of dogs, cats, and other animals suffer from zoophobia.

Final Exam in Physical Science

Name_____

Multiple choice

1. When an unbalanced force acts on an object, the force
   a. changes the motion of the object

   b. is canceled by another force.

   c. does not change the motion of the object

   d. is equal to the weight of the object

2. Air resistance is a type of

   a. rolling friction

   b. sliding friction

   c. centripetal force

   d. fluid friction

3. Which of the following is not a projectile?

   a. a satellite

   b. a thrown ball

   c. a ball on the ground

   d. a soaring arrow

4. the resistance of an object to any change in its motion is called

a. inertia

b. friction

c. gravity

d. weight

5. The product of an object's mass and its velocity is called the object's

a. net force

b. weight

c. momentum

d. gravitation

6. The amount of work done on an object is obtained by multiplying

a. input force and output force

b. force and distance

c. time and force

d. efficiency and work

7. The rate at which work is done is called

a. output force

b. efficiency

c. power

d. mechanical advantage

8. One way a machine can make work easier for you is by

a. decreasing the amount of work you do

b. changing the direction of your force

c. increasing the amount of work required for a task

d. decreasing the friction you encounter

9. The output force is greater than the input force for a

a. pizza cutter

b. hockey stick

c. single fixed pulley

d. screw

10. An example of a second-class lever is a

a. seesaw

b. shovel

c. paddle

d. wheelbarrow

True or False

11. The SI unit of work is the joule_____

12. The SI unit of power is the watt _____

13. The SI unit of force is the newton._____

14. A pulley can be thought of as an inclined plane wrapped around a cylinder._____

15. A fluid is a material that can easily flow._____

16. Lift is an upward force._____

17. Balanced forces are equal forces acting on an object in opposite directions._____

18. Rolling friction occurs when two solid surfaces *slide* over each other._____

19. The greatest velocity a falling object reaches is called its momentum._____

20. Power = work done/time _____

Short Answer

21. What are the six basic simple machines?

22. Why isn't there an ideal machine?

23. What simple machine is a broom?

24. What is the force that acts in the opposite direction of gravity in freefall?

25. What is the formula for Density?

Name _____ Date _____ Class _____

Unit Test

Bits and Pieces III

1. a. Estimate the following and explain how you made your estimate:

0.52 + 1.2 4.4 – 1.29

b. For each problem in part (a), find the exact sum or difference.

2. A group of students went to the grocery store. The students spent $15.20 altogether. Each student spent $1.90. how many students were in this group?

A. 6 B. 7 C. 8 D. 9

3. Every night Dan's dad puts any pennies or nickels he has in his pocket into a container for Dan. Dan does not remove any money. Dave next door has the same arrangement with his mom. Here is the data from the third week:

Daily cumulative Total for Week 3

	Monday	**Tuesday**	**Wednesday**	**Thursday**	**Friday**
Dave	$0.51	$0.68	$0.84	$1.26	$1.63
Dan	$0.72	$0.90	$1.02	$1.38	$1.76

a. Who had the most on Wednesday and by how much?

b. Who made the most over the week and by how much?

c. How much would Dan and Dave have if they combined their money on Friday?

4. Ms. Sze is grading math tests. A student's work on a problem is given below:
   0.23 x 2.07 = 0.04761
   Is the student correct? Explain.

5. Gabrielle bought 5 CDs. The individual cost of each CD was $14.50, $13.95, $14.99, $12.75, and $16.95. The closest estimate to the total cost of the five CDs is:

A. $100 B. $50 C. $75 D. $80

6. During gym class, Troy jumped 4.5 feet. Brendon jumped 3.72 feet. How much further did Troy jump than Brendon?

A. 1.22 ft B. 0.82 ft C. 0.78 ft D. 1.78 ft

7. Charissa stopped at a deli to buy lunch. She bought a turkey sandwich for $2.40, a bag of pretzels for $0.70, and a lemonade for $1.10. How much did she pay for her lunch?

8. Which product is the smallest?
A. 0.3 x 0.4 B. 0.03 x 0.04 C. 0.3 x 0.004 D. 0.003 x 0.04

9. After which digit would the decimal be placed in the following product?
2.4 x 51.44 = 123456

A. after the 1 B. after the 2 C. after the 3 D. after the 4

10. How many decimal places are in the product of 3.76 x 42.89?
A. 2 B. 3 C. 4 D. 5

11. How many decimal places are in the division of 3.75 ÷ 0.25?
A. 0 B. 1 C. 2 D. 4

12. Which problem has the same quotient as 3.2 ÷ 14.5?
A 32 ÷ 14.5 B. 320 ÷ 145 C. 32 ÷ 145 D. 14.5 ÷ 3.2

Curriculum Vitae

M. Glenn Cason
glenncason101@yahoo.com

FORMAL EDUCATION

- WALDEN UNIVERSITY: Doctorate of Education in Teacher Leadership—GPA 4.0
- NORTHWESTERN UNIVERSITY: Master of Music in Saxophone Performance, Magna cum laude, Finalists for Doctorate of Musical Arts in Instrumental Conducting
- UNIVERSITY OF SOUTH CAROLINA: Bachelor of Music Education and Performance Certificate, Cum laude, President's Honor List, Dean's List, Honor's College
- CLINTON HIGH SCHOOL: College Prep Diploma, High Honor graduate, National Honor Society, International Thespian Society, Honor Thespian

CONTINUING EDUCATION

- BIBLE TRAINING CENTRE FOR PASTORS: Bible Training for Church Leadership certificate
- FURMAN UNIVERSITY: South Carolina Governor's School for the Arts—gifted and talented education
- UNIVERSITY OF NORTH CAROLINA—Orff Level 1 certification
- AUGUSTA COLLEGE (now Augusta State University)—Post graduate classes

PROFESSIONAL RECOGNITIONS AND MEMBERSHIPS

- Prepared, programmed and managed all details for an exclusive 1992 Jazz Band performance for President George H. W. Bush and performance for the Paul Coverdell senate run-off election
- Tiger Middle School Service Excellence Award 2003; 5-time Service Award Recipient
- Sudler Silver Scroll, EPCOT Center Walt Disney World Grand Opening Celebrations and Dedication Ceremony Musician, National Association of Jazz Educators Special Citation for Outstanding Musicianship; John Philip Sousa Band Award
- Kappa Delta Pi International Honor Society in Education, Phi Mu Alpha Sinfonia Fraternity, Pi Kappa Lambda National Music Honor Society; Phi Delta Kappa International member; local Chairman of Southern Association & Accreditation of Schools 10-year study music subcommittee; Professional Association of Georgia Educators, Georgia Music Educators Association, and Music Educators National Conference

ADJUDICATION, PROFESSIONAL CLINICIAN, AND PRESENTATIONS

- ADJUDICATOR
  Georgia Governor's Honor Program Final Interviews, 6 years; All-State Band Final Auditions, 6 years; District Band Honor Band Auditions, 7 years; Cobb County Fall Solo & Ensemble, 3 years; Georgia Music Educators Association District Six Jazz Ensemble Festival

- MASTER CLASSES AND SAXOPHONE CLINICIAN
  EFG High School Symphonic and Concert Band Clinics, 4 years; KLM High School; HIJ High School; LMN Middle School; WXY Middle School; McNO Middle School, 3 years; STU Middle School, 3 years; and NOP High School, 2 years

- PRESENTATIONS TO FACULTY
  "Fair is not equal"; Discipline with Dignity, Chapter 5: Consequences vs. Punishment; "Differentiating instruction: Why bother?"

PUBLIC SERVICE

- Founding member of the Cobb Wind Symphony (1999 to present): featured performances at: GMEA In-Service Conference 2003, 2007, and 2011; CBDNA/NBA Southeast Convention 2002 and 2008; 2003 Midwest International Band and Orchestra Clinic Grand Finale Concert; Cobb County (GMEA District XII) District Honor Band 2006
- Bramlett Towneship Architectural Control Committee Chairman (2003-2005); Spinnaker Cove Condominium Association Director (2001), Vice-President (2002)
- American Taekwondo Association: brown belt recommended. Published amateur photographer. Producer for South Carolina Governor's School for the Arts' teacher internship informational video. Co-originator of Instrumental Ministry Resources, Inc. music publishing company. Recording artist for commercial albums, featured saxophone soloist performer, volunteer director and performer for community quartets and jazz ensembles. Robotics Club sponsor.
- Involvement in major musicals as Music Director/Conductor: Stop the World I Want to Get Off; Orchestra Member: Oklahoma!, Once Upon a Mattress, Brigadoon, The Music Man, 1940s Radio Hour, Atlanta Passion Play, Man of La Mancha, The Sound of Music, They're Playing Our Song; and Cast Member: Camelot, Annie Get Your Gun, Hello Dolly!, Lil' Abner, and Dark of the Moon

EXPERIENCE

8/02-Present	Tenured instrumental band director: Tiger Middle School; Eddie A. Mosley, Principal (2002-2004); Kimberly Fraker, Principal (2004-2005); Scott Viness, Principal (2006-2008); Craig Wilcox (2008 to present)
8/01-8/02	Law firm administrator: Dupree, Poole & King
2/00-8/01	Law firm office manager: Lord, Bissell & Brook, Atlanta office
9/97-2/00	Law firm administrator: Gorby, Reeves, Peters & Burns, PC
9/94-8/97	Law firm administrator: Isaf, Vaughan & Kerr 8/95-6/96: Substitute Band Director: Clinton High School
9/93-7/94	Office manager: Atlanta Passion Play box office
8/88-7/93	Instrumental band director: Thomson High and Norris Middle School; Shamrock High School
8/85-7/88	Instrumental Director: East Middle School; Thomas Sumter Academy

References

"Analysis of covariance". (2010). Analysis of covariance: Analysis of covariance strengthens predictive statistics. *Analysis of covariance: ANCOVA*. Retrieved June 9, 2011, from http://analysisofcovariance.com/

Abdal-Haqq, I. (1998). Constructivism in teacher education: Considerations for those who would link practice to theory. (ERIC Document Reproduction Service No. ED426986). Retrieved from ERIC database.

Adler, M. A., & Fisher, C. W. (2001). Early reading programs in high-poverty schools: A case study of beating the odds. *Reading Teacher, 54* (6), 616. Retrieved from ERIC database.

American Psychological Association. (1997, November, 1997). Learner-centered psychological principles: A framework for school reform & redesign. Retrieved April 17, 2010, from http://www.apa.org/ed/governance/bea/learner-centered.pdf

American Psychological Association. (2008). Learner-centered psychological principles. Retrieved February 22, 2008, from http://search.apa.org/search?query= learner+centered+psychological+principles

Antonio, D. M. S. (2008). Understanding students' strengths and struggles. *Educational Leadership, 65* (7), 74-79. Retrieved from Education Research Complete database.

Artino, A. R., Jr. (2008). Cognitive load theory and the role of learner experience: An abbreviated review for educational practitioners. *AACE Journal, 16* (4), 425-439. Retrieved from Education Research Complete database.

Aud, S., Hussar, W., Planty, M., Snyder, T., Bianco, K., Fox, M., . . . Drake, L. (2010). The Condition of education 2010. Retrieved June 12, 2010, from http://nces.ed.gov/pubsearch/pubsinfo.asp?pubid=2010028

Azevedo, R., Moos, D., Greene, J., Winters, F., & Cromley, J. (2008). Why is externally-facilitated regulated learning more effective than self-regulated learning with hypermedia? *Educational Technology Research & Development, 56*(1), 45-72. doi:10.1007/s11423-007-9067-0

Bandeira de Mello, V., Blankenship, C., & McLaughlin, D. H. (2009, October 27, 2009). Mapping state proficiency standards onto NAEP scales: 2005-2007. Retrieved March 27, 2010, from http://nces.ed.gov/nationsreportcard/pubs/studies/2010456.asp

Barber, M., & Mourshed, M. (2007). How the world's best-performing school systems come out on top. Retrieved from http://www.mckinsey.com/

Barley, Z., Lauer, P. A., Arens, S. A., Apthorp, H. S., Englert, K. S., Snow, D., & Akiba, M. (2002). Helping at-risk students meet standards: A synthesis of evidence-based classroom practices. Retrieved from www.mcrel.org

Barley, Z. A., & Wegner, S. (2010). An examination of the provision of supplemental educational services in nine rural schools. *Journal of Research in Rural Education, 25*(4). Retrieved from http://www.jrre.psu.edu/articles/25.5.pdf

Barnett, R. (2010, October 18, 2010). School in poorer area blazes path to success, News: Education, *The Greenville News,* p. 1.

Barton, P. E., & Coley, R. J. (2009a). Parsing the achievement gap II. *Policy information report, 2010*. Retrieved from www.ets.org/research/pic

Barton, P. E., & Coley, R. J. (2009b). Those persistent. *Educational Leadership, 67* (4), 18-23. 45463463). Retrieved from Education Research Complete database.

Beesley, A., Moore, L., & Gopalani, S. (2010). *Student mobility in rural and nonrural districts in five Central Region states* (No. 089; Issues & Answers Report, REL 2010). Washington, DC: U.S. Department of Education, Institute of Education Sciences, National Center for Education Evaluation and Regional Assistance, Regional Educational Laboratory Central. Retrieved from http://ies.ed.gov/ ncee/edlabs.

Betsch, T., Brinkmann, B. J., Fiedler, K., & Breining, K. (1999). When prior knowledge overrules new evidence: Adaptive use of decision strategies and the role of behavioral routines. *Swiss Journal of Psychology/Schweizerische Zeitschrift fÃ¼r Psychologie/Revue Suisse de Psychologie, 58*(3), 151-160. doi:10.1024//1421-0185.58.3.151

Black, P., & Wiliam, D. (2009). Developing the theory of formative assessment. *Educational Assessment, Evaluation & Accountability, 21*(1), 5-31. doi: 10.1007/s11092-008-9068-5

Blair, R. (2007, April 22). Putting the focus on learning [Final edition], *Tampa Tribune*. Retrieved from ProQuest Newsstand. (Document ID: 1258782621).

Boyles, C. (2009a, 2008). The challenge of student engagement. *Learning-Focused Connections Chronicles*. Retrieved August 1, 2009, from http://www.learningfocused.com/article.php?id=146&vw=3

Boyles, C. (2009b, 2008). Does a rising tide lift all boats? *Learning-Focused Connections Chronicles*. Retrieved August 1, 2009, from http://www.learningfocused.com/article.php?id=26&vw=3

Bransford, J. D., Brown, A. L., & Cocking, R. R. (1999). How people learn: Brain, mind, experience, and school. (ERIC Document Reproduction Service No. ED436276). Retrieved from ERIC database.

Bransford, J. D., Brown, A. L., & Cocking, R. R. (2000). *How people learn: Brain, mind, experience, and school. Expanded edition*. Washington, DC: National Academy Press.

Bransford, J. D., Brown, A. L., Cocking, R. R., & National Academy of Sciences - National Research Council (1999). How people learn: Brain, mind, experience, and school. Retrieved from eLibrary database.

Bransford, J. D., & Schwartz, D. L. (1999). Rethinking transfer: A simple proposal with multiple implications. *Review of Research in Education, 24*(1), 61-100. doi: 10.3102/0091732x024001061

Bransford, J. D., Sherwood, R., Vye, N., & Rieser, J. (1986). Teaching thinking and problem solving: Research foundations. *American Psychologist, 41*(10), 1078-1089. doi:10.1037/0003-066X.41.10.1078

Brookhart, S., Moss, C., & Long, B. (2008). Formative assessment that empowers. *Educational Leadership, 66* (3), 52-57. Retrieved from Education Research Complete database.

Brown, K. M., Anfara, V. A. J. R., & Roney, K. (2004). Student achievement in high performing, suburban middle schools and low performing, urban middle schools: Plausible explanations for the differences. *Education and Urban Society, 36*(4), 428-456. doi:10.1177/0013124504263339

Calandra, B., Brantley-Dias, L., & McNeal, K. (2007). An electronic system to support novice teachers' reflective lesson design. *Multicultural Education & Technology Journal, 1*(2), 100-111. doi:10.1108/17504970710759594

Cargill, D. (2009, 2008). Using the strategies wisely. *Learning-Focused Connections Chronicles*. Retrieved August 1, 2009, from http://www.learningfocused.com/article.php?id=21&vw=3

Cason, G. (2007). *Praxis 1: Theoretical perspectives of leadership in a school district*. Manuscript. Walden University.

Center on Education Policy. (2009a). Has student achievement increased since 2002? State test score trends through 2006–07 *State testing data*. Retrieved October 28, 2009, from http://www.cep-dc.org/index.cfm?fuseaction=Page.viewPage&pageId=570&parentID=481

Center on Education Policy. (2009b). Intensified support: Changes in school restructuring in Georgia under the No Child Left Behind act *NCLB: Restructuring: Georgia*.

Retrieved October 28, 2009, from http://www.cep-dc.org/index.cfm?fuseaction=page.viewPage&pageID=543&nodeID=1

Center on Education Policy. (2009c). Is the emphasis on "proficiency" shortchanging higher- and lower-achieving students? *State test score trends through 2007-08, 2010*. Retrieved from www.cep-dc.org

Center on Education Policy. (2009d). School improvement and restructuring. *Compendium of key studies of the No Child Left Behind Act*. Retrieved October 28, 2009, from http://www.cep-dc.org/_data/n_0001/resources/live/School%20Improvement%20and%20Restructuring.pdf

Center on Education Policy. (2011). Update with 2009-10 data and five-year trends: How many schools have not made adequate yearly progress? Retrieved June 7, 2011, from http://www.cep-dc.org/

Characteristics of the world's high-performing school systems (2008, Spring 2008). *Gifted Child Today, 31* (2), 8-9. Retrieved from Education Research Complete database.

Chenoweth, K. (2010). Leaving nothing to chance. *Educational Leadership, 68* (3), 16-21. Retrieved from Education Research Complete database.

Christen, W. L., & Murphy, T. J. (1991). Increasing comprehension by activating prior knowledge. *Eric Clearinghouse on Reading Communication Skills*. (ERIC Document Reproduction Service No. ED328885). Retrieved from ERIC database.

Chudowsky, N., Chudowsky, V., & Kober, N. (2009). State test score trends through 2007-08, Part I: Is the emphasis on "proficiency" shortchanging higher- and lower-achieving students? *State test score trends*. Retrieved from www.cep-dc.org

Cicchinelli, L. F., & Barley, Z. (2010). Sustaining coherent reform: An evaluation guide for districts and schools. Retrieved from www.mcrel.org

Constructivism. (2004). *Encyclopedia of Evaluation, 2009*(August 6). Retrieved from http://sage-ereference.com/evaluation/Article_n103.html

Cook, M. P. (2006). Visual representations in science education: The influence of prior knowledge and cognitive load theory on instructional design principles. *Science Education, 90*(6), 1073-1091. doi:10.1002/sce.20164

Creative Research Systems. (2010). Sample size calculator. Retrieved July 8, 2010, from http://www.surveysystem.com/sscalc.htm

Creswell, J. W. (2003). *Research design: Qualitative, quantitative, and mixed methods approaches* (2nd ed.). Thousand Oaks, CA: Sage.

Deissler, C., Fondriest, A., & Marlar, J. (2007). Passport to reading. Retrieved from http://kaleighbelle.googlepages.com/RLfinal.doc

Division of Instruction (1990). Better thinking and learning: Building effective teaching through educational research. (Classroom guide No. ED353561). Retrieved from ERIC database.

Dochy, F., Segers, M., & Buehl, M. M. (1999). The relation between assessment practices and outcomes of studies: The case of research on prior knowledge.

[ERIC Document Reproduction Service]. *Review of Educational Research, 69*(2), 145. doi:10.3102/00346543069002145

Dong, Y. R. (2009). Linking to prior learning. *Educational Leadership, 66* (7), 26-31. Retrieved from Academic Search Premier database.

Donovan, M. S., Bransford, J. D., & Committee on How People Learn (2005a). How students learn: Mathematics in the classroom. Retrieved from elibrary database.

Donovan, M. S., Bransford, J. D., & Committee on How People Learn. (2005b). *How students learn: Mathematics in the classroom*. Washington, DC: National Academies Press.

Donovan, M. S., Bransford, J. D., Pellegrino, J. W., & National Academy of Sciences - National Research Council. (1999). *How people learn: Bridging research and practice*. Washington, DC: National Academy Press.

Downey, M. (2010, January 3, 2010). Teacher report cards, Opinion article, *The Atlanta Journal-Constitution*. Retrieved from http://www.ajc.com/opinion/maureen-downey-teacher-report-793764.html

Dunn, R., Craig, M., Favre, L., Markus, D., Pedota, P., Sookdeo, G., . . . Terry, B. (2010). No light at the end of tunnel vision: Steps for improving lesson plans. *Clearing House: A Journal of Educational Strategies, Issues and Ideas, 83*(5), 194-206. doi:10.1080/00098650903507460

Education Trust (2003). Education watch: Georgia. Key education facts and figures. Achievement, attainment and opportunity. From elementary school through

college. *EdWatch Online State Summary Reports*. (ERIC Document Reproduction Service No. ED478511). Retrieved from ERIC database.

Ellsworth, J. B. (2000). Surviving change: A survey of educational change models. (ERIC Document Reproduction Service No. ED443417). Retrieved from ERIC database.

Federal Interagency Forum on Child and Family Statistics. (2009). *America's children: Key national indicators of well-being*. Washington, DC: U.S. Government Printing Office. Retrieved from http://childstats.gov

Futrell, M. H., & Gomez, J. (2008). How tracking creates a poverty of learning. *Educational Leadership, 65* (8), 74-78. Retrieved from Education Research Complete database.

Gaddy, B. B., Dean, C. B., & Kendall, J. S. (2002). *Noteworthy perspectives: Keeping the focus on learning*. Aurora, CO: Mid-continent Research for Education and Learning. Retrieved from www.mcrel.org.

Gagné, R. M. (1973). Observations of school learning. (ERIC Document Reproduction Service No. ED084311). Retrieved from ERIC database.

Gagné, R. M. (1980). Preparing the learner for new learning. [ERIC Document Reproduction Service]. *Theory Into Practice, 19*(1), 6-9. doi: 10.1080/00405848009542865

Gangopadhyay, P. (2002). Making evaluation meaningful to all education stakeholders. *Evaluation management*. Retrieved from http://www.wmich.edu/evalctr/checklists/checklistmenu.htm

Garrett, J. L. (2007). A teaching repertoire. *Kappa Delta Pi Record, 44* (1), 6. (ERIC Document Reproduction Service No. EJ781252). Retrieved from ERIC database.

Garrison, W. M. (2004). Profiles of classroom practices in U.S. public schools. [ERIC Document Reproduction Service]. *School Effectiveness and School Improvement, 15*(3-4), 30. doi:10.1080/09243450512331383252

Georgia Department of Education. (2003a). 2003 AYP Summary. Retrieved November 16, 2007, from http://app.doe.k12.ga.us/ows-bin/owa/ayp_main.p_choose

Georgia Department of Education. (2003b). About AYP. Retrieved from http://app3.doe.k12.ga.us/ows-bin/owa/ayp_sys.entry_form

Georgia Department of Education. (2003c). School reports: Georgia tests, CRCT 6, Tiger Middle School. Retrieved September 25, 2009, from http://www.doe.k12.ga.us

Georgia Department of Education. (2003d). School reports: Georgia tests, CRCT 7, Tiger Middle School. Retrieved September 25, 2009, from http://www.doe.k12.ga.us

Georgia Department of Education. (2003e). School reports: Georgia tests, CRCT 8, Tiger Middle School. Retrieved September 25, 2009, from http://www.doe.k12.ga.us

Georgia Department of Education. (2003f). Summary of 2003 Adequate yearly progress. Retrieved October 10, 2009, from http://app3.doe.k12.ga.us

Georgia Department of Education. (2004a). 2004 Adequate yearly progress (AYP) overview report *2004 AYP*. Retrieved October 10, 2009, from http://public.doe.k12.ga.us

Georgia Department of Education. (2004b). 2004 AYP. Retrieved November 16, 2007, from http://public.doe.k12.ga.us

Georgia Department of Education. (2005a). 2005 Adequate yearly progress (AYP) overview report. *2005 AYP*. Retrieved October 10, 2009, from http://public.doe.k12.ga.us

Georgia Department of Education. (2005b). 2005 AYP. Retrieved November 16, 2007, from http://public.doe.k12.ga.us

Georgia Department of Education. (2005c). District profile: Local County. Retrieved March 10, 2010, from http://www.gadoe.org

Georgia Department of Education. (2005d). School profile: Tiger Middle School. Retrieved March 10, 2010, from http://www.gadoe.org

Georgia Department of Education. (2006a). 2006 Adequate yearly progress (AYP) overview report. *2006 AYP*. Retrieved October 10, 2009, from http://public.doe.k12.ga.us

Georgia Department of Education. (2006b). 2006 AYP. Retrieved November 16, 2007, from http://public.doe.k12.ga.us

Georgia Department of Education. (2006c). Georgia tests, CRCT 6, Tiger Middle School. Retrieved September 25, 2009, from http://www.doe.k12.ga.us

Georgia Department of Education. (2006d). Georgia tests, CRCT 7, Tiger Middle School. Retrieved September 25, 2009, from http://www.doe.k12.ga.us

Georgia Department of Education. (2006e). Georgia tests, CRCT 8, Tiger Middle School. Retrieved September 25, 2009, from http://www.doe.k12.ga.us

Georgia Department of Education. (2007a). 2007 Adequate yearly progress (AYP) overview report. *2007 AYP*. Retrieved October 10, 2009, from http://public.doe.k12.ga.us

Georgia Department of Education. (2007b). 2007 AYP. Retrieved November 16, 2007, from http://public.doe.k12.ga.us

Georgia Department of Education. (2007c). 2007 AYP. *State of Georgia*. Retrieved October 8, 2009, from http://public.doe.k12.ga.us

Georgia Department of Education. (2008a). 2007-2008 State of Georgia K-12 public schools annual report card for Local County. Retrieved from http://public.doe.k12.ga.us

Georgia Department of Education. (2008b). 2008 Adequate yearly progress (AYP) overview report. *2008 AYP*. Retrieved October 10, 2009, from http://public.doe.k12.ga.us

Georgia Department of Education. (2008c). 2008 AYP. Retrieved March 21, 2009, from http://public.doe.k12.ga.us

Georgia Department of Education. (2008d). 2008 CRCT testing brief final. Retrieved December 12, 2010, from http://public.doe.k12.ga.us/DMGetDocument.aspx/CRCT%20Testing%20Brief%202008.pdf?p=6CC6799F8C1371F68C3212E394CE6172EB8B04B757B7918521E95AE526F336D5&Type=D

Georgia Department of Education. (2008e). Georgia academic placement and promotion for 8th grade students. Retrieved from http://public.doe.k12.ga.us

Georgia Department of Education. (2008f). Georgia tests, CRCT 6, Tiger Middle School. Retrieved September 25, 2009, from http://www.doe.k12.ga.us

Georgia Department of Education. (2008g). Georgia tests, CRCT 7, Tiger Middle School. Retrieved September 25, 2009, from http://www.doe.k12.ga.us

Georgia Department of Education. (2008h). Georgia tests, CRCT 8, Tiger Middle School. Retrieved September 25, 2009, from http://www.doe.k12.ga.us

Georgia Department of Education. (2009a, October 1, 2009). 2008-2009 NCLB/AYP. *Adequate yearly progress*. Retrieved December 11, 2010, from http://public.doe.k12.ga.us

Georgia Department of Education. (2009b). 2008-2009 Report card. *Herschel Jones Middle School*. Retrieved December 11, 2010, from http://public.doe.k12.ga.us

Georgia Department of Education. (2009c). 2009 Adequate yearly progress (AYP) overview report. *2009 AYP*. Retrieved December 12, 2010, from http://www.gadoe.org

Georgia Department of Education. (2009d, October 1, 2009). 2009 Adequate yearly progress (AYP) overview report *NCLB/AYP*. Retrieved December 12, 2010, from http://www.gadoe.org/ReportingFW.aspx?PageReq=103&StateId=ALL&T=1&FY=2009

Georgia Department of Education. (2009e, July 14, 2009). 2009 Adequate yearly progress by the numbers. *State detail*. Retrieved August 26, 2009, from http://www.gadoe.org/ayp2009.aspx

Georgia Department of Education. (2009f, July 14, 2009). 2009 AYP. *Adequate yearly progress*. Retrieved August 2, 2009, from http://public.doe.k12.ga.us

Georgia Department of Education. (2009g, July 14, 2009). 2009 AYP charts. Retrieved August 26, 2009, from http://www.gadoe.org/ayp2009.aspx

Georgia Department of Education. (2009h). 2009 AYP: More than 79% of schools make AYP. *2009 AYP*. Retrieved 2009, from http://public.doe.k12.ga.us/press/2009/press07152009.html

Georgia Department of Education. (2009i, July 14, 2009). 2009 Initial system report (7-14-09). *2009 AYP*. Retrieved August 26, 2009, from http://www.gadoe.org/ayp2009.aspx

Georgia Department of Education. (2009j). ABCs of AYP. Retrieved from http://www.localschooldistrict

Georgia Department of Education. (2009k). Answers to frequently asked questions about AYP: What tests count toward AYP? *Adequate Yearly Progress (AYP) No Child Left Behind*. Retrieved August 14, 2009, from http://public.doe.k12.ga.us/ayp2009.aspx?PageReq=FAQSAYP2009

Georgia Department of Education. (2009l). Criterion-Referenced Competency Tests (CRCT). Retrieved August 3, 2009, from http://www.gadoe.org/ci_testing.aspx?PageReq=CI_TESTING_CRCT

Georgia Department of Education. (2009m). District profile: Local county. Retrieved March 5, 2010, from http://www.gadoe.org

Georgia Department of Education. (2009n). State of Georgia 2009 AYP. *State of Georgia 2009 AYP*. Retrieved August 15, 2009, from http://public.doe.k12.ga.us/ReportingFW.aspx?PageReq=103&StateId=ALL&T=1&FY=2009

Georgia Department of Education. (2009o). Testing Brief: Spring 2009 Georgia Criterion-Referenced Competency Tests in reading, English/language arts, mathematics, science, and social studies April 6 -May 8, 2009. Retrieved from http://public.doe.k12.ga.us/DMGetDocument.aspx/2009%20CRCT%20Testing%20Brief_%20FINAL.pdf?p=6CC6799F8C1371F6659FC5879F71DAC3375B8CDDB76F03BA0B6187DFCF999CF8&Type=D

Georgia Department of Education. (2010a). 2009-2010 NCLB/AYP. *Tiger Middle School.* Retrieved December 11, 2010, from http://public.doe.k12.ga.us

Georgia Department of Education. (2010b). 2009-2010 Report card. *Indicators*. Retrieved December 13, 2010, from http://www.gadoe.org

Georgia Department of Education. (2010c). 2009-2010 Report card. *Enrollment by demographics*. Retrieved December 12, 2010, from http://public.doe.k12.ga.us

Georgia Department of Education. (2010d). 2010 Adequate yearly progress (AYP) overview report. *2010 AYP*. Retrieved December 12, 2010, from http://www.gadoe.org

Georgia Department of Education. (2010e, October 15, 2010). 2010 Adequate yearly progress (AYP) overview report *NCLB/AYP*. Retrieved December 12, 2010, from http://www.gadoe.org/ReportingFW.aspx?PageReq=103&StateId=ALL&T=1&FY=2010

Georgia Department of Education. (2010f, October 15, 2010). 2010 AYP by the numbers. *State detail*. Retrieved December 12, 2010, from http://public.doe.k12.ga.us/ayp2010.aspx

Georgia Department of Education. (2010g). 2010 CRCT testing brief final. Retrieved December 12, 2010, from http://public.doe.k12.ga.us/DMGetDocument.aspx/2010_CRCT_Testing%20Brief_%20FINAL.pdf?p=6CC6799F8C1371F69D1044A4D3C90D68B2F5F45F8251073D6AACB3255C6AEBF2&Type=D

Georgia Department of Education. (2010h). Promotion and placement in state law. *Promotion and retention guidance*. Retrieved May 1, 2010, from http://public.doe.k12.ga.us/_documents/doe/external/policy/prp_state_law.pdf

Georgia Department of Education. (2010i). State board rule 160-4-2-.11: Promotion, placement, and retention. *Promotion and retention guidance*. Retrieved May 1, 2010, from http://public.doe.k12.ga.us/_documents/doe/legalservices/160-4-2-.11.pdf

Georgia Department of Education. (2010j). State of Georgia 2010 AYP. *NCLB/AYP*. Retrieved December 12, 2010, from http://public.doe.k12.ga.us/ReportingFW.aspx?PageReq=103&StateId=ALL&T=1&FY=2010

Georgia Department of Education. (2011). Fewer Georgia schools in needs improvement status. Retrieved June 9, 2011, from http://www.doe.k12.ga.us/pea_communications.aspx?ViewMode=1&obj=1958

Gill, S. R. (2008). The comprehension matrix: A tool for designing comprehension instruction. *Reading Teacher, 62*(2), 106-113. doi:10.1598/RT.62.2.2

Gomez, T. (2009). Developing emergent literacy skills in kindergarten students using pre-A books. Ed.D. dissertation, Walden University, United States--Minnesota.

Goodwin, B. (1999). *Improving teacher quality: Issues & policies* (policy brief). Aurora, CO: Mid-continent Research for Education and Learning. Retrieved from www.mcrel.org.

Goodwin, B. (2010a). *Changing the odds for student success: What matters most*. Denver, CO: Mid-continent Research for Education and Learning. Retrieved from www.mcrel.org.

Goodwin, B. (2010b). Good teachers may not fit the mold. *Educational Leadership, 68* (4), 79-80. Retrieved from Education Research Complete database.

Gorski, P. (2008). The myth of the "culture of poverty". *Educational Leadership, 65* (7), 32-36. Retrieved from Education Research Complete database.

Gravetter, F. J., & Wallnau, L. B. (2008). *Essentials of statistics for the behavioral sciences* (6th ed.). Belmont, CA: Thomason Wadsworth.

Guarch, C. V. (2003). Instructional strategies. *Encyclopedia of psychological assessment.* Retrieved July 17, 2009, from http://www.sage-ereference.com/psychassessment/Article_n99.html

Gurlitt, J., & Renkl, A. (2010). Prior knowledge activation: How different concept mapping tasks lead to substantial differences in cognitive processes, learning outcomes, and perceived self-efficacy. *Instructional Science, 38*(4), 417-433. doi: 10.1007/s11251-008-9090-5

Hailikari, T., Katajavuori, N., & Lindblom-Ylanne, S. (2008). The relevance of prior knowledge in learning and instructional design. *American Journal of Pharmaceutical Education, 72* (5), 1-8. Retrieved from Education Research Complete database.

Hamilton, L., Halverson, R., Jackson, S., Mandinach, E., Supovitz, J., & Wayman, J. (2009). *Using student achievement data to support instructional decision making* (Report No. NCEE 2009-4067). Washington, DC: National Center for Education Evaluation and Regional Assistance, Institute of Education Sciences, U.S. Department of Education. Retrieved from http://ies.ed.gov/ncee/wwc/publications/practiceguides/.

Hanushek, E. A., & Rivkin, S. (2010). *Using value-added measures of teacher quality* (Brief 9 No. 00126709). Washington, DC: Urban Institute. Retrieved from ProQuest database.

Hart, B., & Risley, T. R. (2003). The early catastrophe. *Education Review, 17* (1), 110-118. Retrieved from Education Research Complete database.

Hawley, W., & Rollie, D. L. (Eds.). (2007). *The keys to effective schools: Educational reform as continuous improvement* (2nd ed.). Thousand Oaks, CA: Corwin Press.

Haycock, K., & Crawford, C. (2008). Closing the teacher quality gap. *Educational Leadership, 65* (7), 14-19. Retrieved from Education Research Complete database.

Hedges, L. E. (2000). *What being a teacher is all about* (No. 1-56502-016-2): Ohio State University, Columbus Agricultural Education Curriculum Materials Service.

Hendricks, M., Plantz, M. C., & Pritchard, K. J. (2008). Measuring outcomes of United Way-funded programs: Expectations and reality. *New Directions for Evaluation* (119), 13-35. doi:10.1002/ev.266

Henig, J. R. (2008). The spectrum of education research. *Educational Leadership, 66* (4), 6-11. Retrieved from ERIC database.

Herman, R., Dawson, P., Dee, T., Greene, J., Maynard, R., Redding, S., . . . Institute of Education Sciences, W. D. C. (2008a). Turning around chronically low-performing schools. IES practice guide. NCEE 2008-4020. Retrieved from ERIC database.

Herman, R., Dawson, P., Dee, T., Greene, J., Maynard, R., Redding, S., . . . Institute of Education Sciences, W. D. C. (2008b). *Turning around chronically low performing schools: A practice guide* (No. NCEE #2008-4020). Washington, DC: National Center for Education Research, Institute of Education Sciences, U.S. Department of Education. Retrieved from http://ies.ed.gov/ncee/wwc/publications/practiceguides.

Hernandez, A., Kaplan, M. A., & Schwartz, R. (2006). For the sake of argument. *Educational Leadership, 64* (2), 48. Retrieved from ERIC database.

Hickey, E. C. (2006, July 2006). Making the AYP grade with learning-focused schools: A case study. Ph.D. dissertation, Capella University, United States--Minnesota. (Publication No. AAT 3206367). Retrieved from Dissertations & Theses: Full Text database.

Hollins, E. R. (2006). Transforming practice in urban schools. *Educational Leadership, 63* (6), 48-52. (ERIC Document Reproduction Service No. EJ745562). Retrieved from Academic Search Premier database.

Holmqvist, M., Lindgren, G., Mattisson, J., & Svarvell, T. (Writers). (2008). Instruction built on learners' previous knowledge by using the variation theory, *Problems of Education in the 21st Century*: Scientific Methodical Center "Scientia Educologica".

Huebner, T. A. (2009). Balanced assessment. *Educational Leadership, 67* (3), 85-87. Retrieved from Education Research Complete database.

Huebner, T. A. (2010). Differentiated instruction. *Educational Leadership, 67* (5), 79-81. Retrieved from Education Research Complete database.

Huitema, B. E. (2006). Analysis of Covariance (ANCOVA). Encyclopedia of Measurement and Statistics. SAGE Publications. Retrieved from SAGE Reference Online database.

Hung, D., Tan, S.-C., & Koh, T.-S. (2006). From traditional to constructivist epistemologies: A proposed theoretical framework based on activity theory for learning communities. *Journal of Interactive Learning Research, 17* (1), 37. Retrieved from ERIC database.

Institute of Education Sciences. (2010). Assisting students struggling with reading: Response to intervention (RtI) and multi-tier intervention in the primary grades. *IES practice guide, What works clearinghouse,* (NCEE 2009-4045). Retrieved from http://nces.ed.gov/pubsearch/pubsinfo.asp?pubid=WWC20094045

Jackson, C. (2008). Effectiveness of preservice experiences and course work in music education toward teacher self-efficacy in classroom management. D.M.A. dissertation, Shenandoah University, United States -- Virginia. (Publication No. AAT 3370983). Retrieved from Dissertations & Theses: Full Text database.

Jacobs, N., & Harvey, D. (2005). Do parents make a difference to children's academic achievement? Differences between parents of higher and lower achieving students. *Educational Studies, 31*(4), 431-448. doi:10.1080/03055690500415746

Jacobson, L., & Holian, L. (2010). *The relationship between changes in the percentage of students passing and in the percentage testing advanced on state assessment tests in Kentucky and Virginia* (Issues & Answers Report, REL 2010–No. 087). Washington, DC: U.S. Department of Education, Institute of Education Sciences, National Center for Education Evaluation and Regional Assistance, Regional Educational Laboratory Appalachia. Retrieved from http://ies.ed.gov/ncee/edlabs.

Johnson, K. E., Peck, K., & Wise, J. (2007). *The students with disabilities subgroup and adequate yearly progress in Mid-Atlantic Region schools* (No. Issues & Answers Report, REL 2007-No. 018). Washington, DC: U.S. Department of Education, Institute of Education Sciences, National Center for Education Evaluation and Regional Assistance, Regional Educational Laboratory Mid-Atlantic. Retrieved from http://ies.ed.gov/ncee/edlabs.

Johnston, P., & Pearson, P. D. (1982). Prior knowledge, connectivity, and the assessment of reading comprehension. Technical report. No. 245. (ERIC Document Reproduction Service No. ED217402). Retrieved from ERIC database.

Jones, A., Todorova, N., & Vargo, J. (2000). *Improving teaching effectiveness understanding and leveraging prior knowledge for student learning*. Paper presented at the Proceedings of the International Academy for Information Management Annual Conference Brisbane, Australia. Retrieved from ERIC database.

Jones, T. B., & Slate, J. R. (2010). The 65% instructional expenditure ratio and student achievement: Does money matter? *Current Issues in Education*. Retrieved from http://cie.asu.edu/ojs/index.php/cieatasu/issue/view/11/showToc

Kearsley, G. (2009). Conditions of learning. *Explorations in learning & instruction: The theory into practice database.* Retrieved January 1, 2010, from http://tip.psychology.org/gagne.html

Kendall, J. S., Ryan, S., Weeks, S., Alpert, A., Schwols, A., & Moore, L. (2008). *Thinking and learning skills: What do we expect of students?* Denver, CO: Mid-continent Research for Education and Learning. Retrieved from www.mcrel.org.

Kenkel, S., Hoelscher, S., & West, T. (2006). Leading adolescents to mastery. *Educational Leadership, 63* (7), 33. Retrieved from ERIC database.

Khadaroo, S. T. (2010). Economic segregation rising in US public schools. Retrieved July 9, 2010, from http://www.csmonitor.com/USA/Education/2010/0527/Economic-segregation-rising-in-US-public-schools

Kirschner, P. A., Sweller, J., & Clark, R. E. (2006). Why minimal guidance during instruction does not work: An analysis of the failure of constructivist, discovery,

problem-based, experiential, and inquiry-based teaching. *Educational Psychologist, 41*(2), 75-86. doi:10.1207/s15326985ep4102_1

Kruse, K. (2010). Gagné's nine events of instruction: An introduction. *Beginner basics*. Retrieved January 1, 2010, from http://www.e-learningguru.com/articles/art3_3.htm

Kutash, J., Nico, E., Gorin, E., Rahmatullah, S., & Tallant, K. (2010, September). The school turnaround field guide. *FSG Social Impact Advisors*.

Kyriakides, L. (2008). School effectiveness and school improvement: Testing the validity of the comprehensive model of educational effectiveness: A step towards the development of a dynamic model of effectiveness. *School Effectiveness and School Improvement, 19*(4), 429-446. doi:10.1080/09243450802535208

Lambert, L., Walker, D., Zimmerman, D. P., Cooper, J. E., Lambert, M. D., Gardner, M. E., & Szabo, M. (2002). *The constructivist leader* (2nd ed.). New York: Teachers College Press.

Le, V.-N., Lockwood, J. R., Stecher, B. M., Hamilton, L. S., & Martinez, J. F. (2009). A longitudinal investigation of the relationship between teachers' self-reports of reform-oriented instruction and mathematics and science achievement. *Educational Evaluation and Policy Analysis, 31*(3), 200-220. doi: 10.3102/0162373709336238

Learning Theories Knowledgebase. (2008, December). *Cognitivism at Learning-Theories.com*. Retrieved December 23, 2008, from http://www.learning-theories.com/cognitivism.html

Lefkowits, L., & Woempner, C. (2006). *Focusing on the basics in beat-the-odds schools* (Policy brief). Denver, CO: Mid-continent Research for Education and Learning. Retrieved from www.mcrel.org.

Levin, B., & Wiens, J. (2003). There is another way: A different approach to education reform. *Phi Delta Kappan, 84* (9), 658. Retrieved from Education Research Complete database.

Levy, H. M. (2008). Meeting the needs of all students through differentiated instruction: Helping every child reach and exceed standards. *Clearing House: A Journal of Educational Strategies, Issues and Ideas, 81*(4), 161-164. doi: 10.3200/TCHS.81.4.161-164

Lieberman, A., & Miller, L. (Eds.). (2001). *Teachers caught in the action: Professional development that matters*. New York: Teachers College Press.

Local County School District. (2009a). AYP Letter 2009 2010. *AYP Information*, Letter to parents/guardians of students in Local County. Retrieved from http://wwwlocalschooldistrict

Local County School District. (2009b, September). First bell. *Local County School District News,* 4.

Local County School District. (2009c). LEA plan-Title I. Retrieved July 20, 2009, from www.localschooldistrict

Local County School District. (2009d). Middle school improvement plans: Tiger SIP. *Improvement plans*. Retrieved July 20, 2009, from http://www.localmiddleschool

Local County School District. (2009e). What is adequate yearly progress (AYP)? *AYP Information*. Retrieved August 2, 2009, from http://www.localschooldistrict

Local County School District. (2010a, March). First bell. *Local County School District News,* 4.

Local County School District. (2010b). News from the board... A report of actions taken during LCBOE meetings. *Minutes,* (August 2010), District enrollment as of 8/23/2010. Retrieved from Local County School District website: https://eboard.eboardsolutions.com

Long, D. L., & Prat, C. S. (2002). Memory for Star Trek: The role of prior knowledge in recognition revisited. *Journal of Experimental Psychology: Learning, Memory, and Cognition, 28*(6), 1073-1082. doi:10.1037//0278-7393.28.6.1037

Lynch, S. A., & Warner, L. (2008). Creating lesson plans for all learners. *Kappa Delta Pi Record, 45* (1), 10-15. Retrieved from ERIC database.

Marsh, J. A., & Robyn, A. (2006). School and district improvement efforts in response to the No Child Left Behind Act. *RAND Working paper*. Retrieved from http://www.rand.org/pubs/working_papers/2006/RAND_WR382.pdf

Marzano, R. J. (1998). *A theory-based meta-analysis of research on instruction*. Aurora, CO: Mid-continent Research for Education and Learning. Retrieved from www.mcrel.org.

Marzano, R. J. (2000). *A new era of school reform: Going where the research takes us*. Aurora, CO: Mid-continent Research for Education and Learning. Retrieved from www.mcrel.org.

Marzano, R. J. (2003a). Classroom management that works: Research-based strategies for every teacher. Retrieved from ERIC database.

Marzano, R. J. (2003b). Using data: Two wrongs and a right. *Educational Leadership, 60* (5), 56. Retrieved from Education Research Complete database.

Marzano, R. J. (2003c). *What works in schools: Translating research into action*. Alexandria, VA: Association for Supervision and Curriculum Development.

Marzano, R. J. (2009). Helping students process information. *Educational Leadership, 67* (2), 86-87. Retrieved from Academic Search Complete database.

Marzano, R. J. (2010). When practice makes perfect...sense. *Educational Leadership, 68* (3), 81-83. Retrieved from Education Research Complete database.

Marzano, R. J., Gaddy, B. B., & Dean, C. (2000a). *What works in classroom instruction*. Aurora, CO: Mid-continent Research for Education and Learning.

Marzano, R. J., Gaddy, B. B., & Dean, C. (2000b). What works in classroom instruction. Retrieved from ERIC database.

Marzano, R. J., Norford, J. S., Paynter, D. E., Pickering, D. J., & Gaddy, B. B. (2001). A handbook for classroom instruction that works. Retrieved from ERIC database.

Marzano, R. J., Pickering, D. J., & Pollock, J. E. (2001). Classroom instruction that works: Research-based strategies for increasing student achievement. *0-87120-899-7*, 187. Retrieved from eLibrary database.

Mass Insight Education and Research Institute. (2010). Why America's best opportunity to dramatically improve student achievement lies in our worst-performing schools. *The Turnaround Challenge Group*. Retrieved from The School

Turnaround Group website: http://www.massinsight.org/publications/turnaround/50/file/1/pubs/2010/04/15/TheTurnaroundChallenge_ExecSumm.pdf

Mayer, R. E. (2004). Teaching of subject matter. *Annual Review of Psychology, 55*(1), 715-744. doi:10.1146/annurev.psych.55.082602.133124

McGee, R., Almquist, J., Keller, J. L., & Jacobsen, S. J. (2008). Teaching and learning responsible research conduct: Influences of prior experiences on acceptance of new ideas. *Accountability in Research: Policies & Quality Assurance, 15*(1), 30-62. doi:10.1080/08989620701783758

McInerney, D. M. (2005). Educational psychology--theory, research, and teaching: A 25-year retrospective. *Educational Psychology, 25*(6), 585. doi: 10.1080/01443410500344670

McLeod, S. (2005). *Data-driven teachers* (White paper). Minneapolis, MN: University of Minnesota. Retrieved from www.microsoft.com/Education/ThoughtLeaders.aspx.

Mid-continent Research for Education and Learning. (2002, Winter). Adequate yearly progress: In-depth. *Changing schools*.

Mid-continent Research for Education and Learning. (2004, Spring). No Child Left Behind and special-needs populations *Changing schools*.

Mid-Continent Research for Education and Learning (2005a). Final report: High-needs schools-What does it take to beat the odds? Retrieved from ERIC database.

Mid-continent Research for Education and Learning. (2005b). *McREL insights - Schools that "Beat the Odds"*. Aurora, CO: Mid-continent Research for Education and Learning. Retrieved from www.mcrel.org.

Mid-continent Research for Education and Learning. (2005c, Winter). McREL study examines how high-needs schools "Beat the Odds". *Changing schools*.

Mid-continent Research for Education and Learning. (2008, Summer). Great teachers, great teaching. *Changing schools, 58*.

Mid-continent Research for Education and Learning. (2010). Ready, set, teach. *Changing schools, 61*(Fall, 2010).

Miller, A. (2004). *Brain-based learning with technological support*: Association for Educational Communications and Technology. Retrieved from ERIC database.

Miller, K. (2003). *School, teacher, and leadership impacts on student achievement* (Policy brief). Aurora, CO: Mid-continent Research for Education and Learning. Retrieved from www.mcrel.org.

Miller, M., & Higgins, B. (2008). Beyond test preparation: Nurturing successful learners through reading and writing workshops. *Kappa Delta Pi Record, 44* (3), 124-127. Retrieved from ERIC database.

Milne, A., & Plourde, L. A. (2006). Factors of a low-SES household: What aids academic achievement? *Journal of Instructional Psychology, 33* (3), 183. (ERIC Document Reproduction Service No. EJ764667). Retrieved from Academic Search Premier database.

Mitchell, K. E. (2006). Getting to the heart of a story. *Teaching Pre K-8, 37* (1), 66-67. (ERIC Document Reproduction Service No. EJ746029). Retrieved from ERIC database.

Muller-Kalthoff, T., & Moller, J. (2006). Browsing while reading: Effects of instructional design and learners' prior knowledge. *ALT-J: Research in Learning Technology, 14*(2), 183-198. doi:10.1080/09687760600668602

Myhill, D., & Brackley, M. (2004). Making connections: Teachers use of children's prior knowledge in whole class discourse. [ERIC Document Reproduction Service]. *British Journal of Educational Studies, 52*(3), 263-275. doi:10.1111/j.1467-8527.2004.00267.x

National Assessment of Educational Progress. (2010). The NAEP glossary of terms. Retrieved November 21, 2010, from http://nationsreportcard.gov/glossary.asp#sig_diff

National Center for Education Statistics. (2009a). Accountability. *State Education Reforms*. Retrieved January 1, 2010, from http://nces.ed.gov/programs/statereform/acc.asp

National Center for Education Statistics. (2009b, November 24, 2009). Trial urban district assessment snapshot reports. *The Nation's report card: Trial urban district assessment mathematics 2009.* Retrieved January 8, 2009, from http://nces.ed.gov/nationsreportcard/pubs/dst2009/2010455.asp

Neuman, S. B. (2003). From rhetoric to reality: The case for high-quality compensatory prekindergarten programs. *Phi Delta Kappan, 85* (4), 286-291. Retrieved from ERIC database.

Newsom, J. (2000, July 22). Guilford schools administrator resigns, Max Thompson is a national authority on education; [All edition], *Greensboro News Record,* p. A 1. Retrieved from ProQuest Newsstand. (Document ID: 56756929).

Nichols, S. L., & Berliner, D. C. (2008). Testing the joy out of learning. *Educational Leadership, 65* (6), 14-18. Retrieved from Education Research Complete database.

No Child Left Behind (NCLB). (2004). *Encyclopedia of Evaluation*. Retrieved August 6, 2009, from http://sage-ereference.com/evaluation/Article_n375.html

Olson, L. (2006). As AYP bar rises, more schools fail: Percent missing NCLB goals climbs amid greater testing. *Education Week, 26* (4). (ERIC Document Reproduction Service No. EJ752591). Retrieved from ERIC database.

Pacchiano, D. M. (2000). A review of instructional variables related to student problem behavior. *Preventing School Failure, 44* (4), 174. (ERIC Document Reproduction Service No. EJ614720). Retrieved from Academic Search Premier database.

Pacetti, L. (2004). Activating strategies. Retrieved from http://www.sw-georgia. resa.k12.ga.us/Reflection%20Meetings/Activating%20Strategies%20111604.doc

Parrett, W., & Budge, K. (2009). Tough questions for tough times. *Educational Leadership, 67* (2), 22-27. Retrieved from Education Research Complete database.

Pashler, H., Bain, P., Bottge, B., Graesser, A., Koedinger, K., McDaniel, M., & Metcalfe, J. (2009). *Organizing instruction and study to improve student learning: A practice guide* (No. NCER 2007-2004). Washington, DC: National Center for Education Research, Institute of Education Sciences, U.S. Department of Education. Retrieved from http://ncer.ed.gov.

Pate, J. L., & Gibson, N. M. (2005). Learning focused schools strategies: The level of implementation and perceived impact on student achievement. *15*. Retrieved from http://www.usca.edu/essays/vol152005/pate.pdf

Payne, R. (2008). Nine powerful practices. *Educational Leadership, 65* (7), 48-52. Retrieved from Education Research Complete database.

Phillips, L. (2009a, 2008). An interview with a Learning-Focused teacher. *Learning-Focused Connections Chronicles*. Retrieved August 1, 2009, from http://www.learningfocused.com/article.php?id=76&vw=3

Phillips, L. (2009b, 2008). The Ten Commandments of Learning-Focused. *Learning-Focused Connections Chronicles*. Retrieved August 1, 2009, from http://www.learningfocused.com/article.php?id=143&vw=3

Phillips, L. (2009c, 2008). This takes too much time! *Learning-Focused Connections Chronicles*. Retrieved August 1, 2009, from http://www.learningfocused.com/article.php?id=86&vw=3

Planty, M., Hussar, W., Snyder, T., Angelina, G. K., Ramani, K., Kemp, J., . . . Dinkes, R. (2009). *The condition of education 2009* (Compendium No. NCES 2009081).

Washington, DC: National Center for Education Statistics, Institute of Education Sciences, U.S. Department of Education. Retrieved from http://nces.ed.gov.

Plucker, J. A., Burroughs, N., & Song, R. (2010). *Mind the (other) gap! The growing excellence gap in K-12 education*. Bloomington, IN: Center for Evaluation & Education Policy, Indiana University, School of Education. Retrieved from http://ceep.indiana.edu/mindthegap/.

Ponticell, J. A. (2006). Theories of learning. *Encyclopedia of Educational Leadership and Administration.* Sage Publications. Retrieved January 1, 2010, from http://www.sage-ereference.com/edleadership/Article_n338.html

Popham, W. J. (2008). What's valid? What's reliable? *Educational Leadership, 65* (5), 78-79. Retrieved from Education Research Complete database.

Popham, W. J. (2009a). Diagnosing the diagnostic test. *Educational Leadership, 66*(6), 90(92).

Popham, W. J. (2009b). A process-Not a test. *Educational Leadership, 66* (7), 85-86. Retrieved from Academic Search Complete database.

Prakash, E. S. (2010). Explicit constructivism: A missing link in ineffective lectures? *Advances in Physiology Education, 34*(2), 93-96. doi:10.1152/advan.00025.2010

Raosoft, Inc. (2004). Sample size calculator. Retrieved March 24, 2009, from http://www.raosoft.com/samplesize.html?nosurvey

Reinhart, S. C. (2000). Never say anything a kid can say! *Mathematics Teaching in the Middle School, 5* (8), 478. Retrieved from Academic Search Complete database.

Riedl, J. (2009, 2007). The scope and influence of Learning-Focused. *Learning-Focused Connections Chronicles*. Retrieved August 1, 2009, from http://www.learningfocused.com/article.php?id=140&vw=3

Ripley, A. (2010, September 20, 2010). A call to action for public schools. *Time, 176,* 92.

Rockwell, S. (2007). Working smarter, not harder: Reaching the tough to teach. Part I: Prior knowledge and concept development. *Kappa Delta Pi Record, 44* (1), 8-12. (ERIC Document Reproduction Service No. EJ781250). Retrieved from ERIC database.

Rockwell, S. (2008). Working smarter, not harder: Reaching the tough to teach. Part II--Content integration. *Kappa Delta Pi Record, 44* (2), 56-61. Retrieved from ERIC database.

Rodriguez, S. (2009). Fear is a good thing: Activating schema. *California English, 14* (4), 20-21. Retrieved from Education Research Complete database.

Rothstein, R. (2008). Whose problem is poverty? *Educational Leadership, 65* (7), 8-13. Retrieved from Education Research Complete database.

Royer, W. (2009). The effects of the learning-focused schools model on student achievement in math and reading and teachers' perceptions of the model. Ed.D. dissertation, Duquesne University, United States--Pennsylvania. (Publication No. AAT 3364359). Retrieved from Dissertations & Theses: Full Text database.

Rubie-Davies, C. M. (2007). Classroom interactions: Exploring the practices of high- and low-expectation teachers. *British Journal of Educational Psychology, 77*(2), 289-306. doi:10.1348/000709906X101601

Sabulis, T. (2010, January 2, 2010). Georgia teacher evaluations: Two views, Metro Atlanta/State news, *The Atlanta Journal-Constitution*. Retrieved from http://www.ajc.com/news/georgia-teacher-evaluations-two-793166.html

Sarrio, J. (2010, January 3, 2010). Teachers to be graded on student test scores, State news, *The Atlanta Journal-Constitution*. Retrieved from http://www.ajc.com/news/teachers-to-be-graded-792562.html

Scherer, M. (2008). Harnessing our power. *Educational Leadership, 65* (7), 7-7. Retrieved from Education Research Complete database.

Schleicher, A. (2009). Lessons from the world. *Educational Leadership, 67* (2), 50-55. Retrieved from Education Research Complete database.

Schochet, P. Z., & Chiang, H. S. (2010). Error rates in measuring teacher and school performance based on student test score gains. NCEE 2010-4004. Retrieved from ERIC database.

Schwartz, D. L., & Bransford, J. D. (1998). A time for telling. *Cognition & Instruction, 16*(4), 475. doi:10.1207/s1532690xci1604_4

Semple, A. (2000). Learning theories and their influence on the development and use of educational technologies. *Australian Science Teachers' Journal, 46* (3), 21. (ERIC Document Reproduction Service No. EJ649503). Retrieved from Academic Search Premier database.

Simons, K. A., & Friedman, R. H. (2008). Seven systemwide solutions. *Educational Leadership, 65* (7), 64-68. Retrieved from Academic Search Complete database.

Sirin, S. R. (2005). Socioeconomic status and academic achievement: A meta-analytic review of research. *Review of Educational Research, 75*(3), 417-453. doi: 10.3102/00346543075003417

Slavin, R. E., Lake, C., & Groff, C. (2009). Effective programs in middle and high school mathematics: A best-evidence synthesis. *Review of Educational Research, 79*(2), 839-911. doi:10.3102/0034654308330968

Smith, J. L. M., Fien, H., & Paine, S. C. (2008). When mobility disrupts learning. *Educational Leadership, 65* (7), 59-63. Retrieved from Education Research Complete database.

Snook, I., O'Neill, J., Clark, J., O'Neill, A.-M., & Openshaw, R. (2009). Invisible learnings? A commentary on John Hattie's book: Visible Learning: A synthesis of over 800 meta-analyses relating to achievement. *New Zealand Journal of Educational Studies, 44* (1), 93-106. Retrieved from Education Research Complete database.

Solochek, J. S. (2007, March 25). Schools adopt new teaching method: [North edition], *St. Petersburg Times,* p. 1. Retrieved from ProQuest Newsstand. (Document ID: 1242860901).

Spires, H. A., & Donley, J. (1998). Prior knowledge activation: Inducing engagement with informational texts. *Journal of Educational Psychology, 90*(2), 249-260. doi: 10.1037/0022-0663.90.2.249

Sternberg, R. J. (2006). Recognizing neglected strengths. *Educational Leadership, 64* (1), 30. (ERIC Document Reproduction Service No. EJ745630). Retrieved from Academic Search Premier database.

Sternberg, R. J., & Zhang, L. f. (2005). Styles of thinking as a basis of differentiated instruction. [ERIC Document Reproduction Service]. *Theory Into Practice, 44*(3), 245. doi:10.1207/s15430421tip4403_9

Stewart, E. B. (2008). School structural characteristics, student effort, peer associations, and parental involvement: The influence of school- and individual-level factors on academic achievement. *Education and Urban Society, 40*(2), 179-204. doi: 10.1177/0013124507304167

Straits, W., & Wilke, R. (2007). How constructivist are we? Representations of transmission and participatory models of instruction in the "Journal of College Science Teaching". *Journal of College Science Teaching, 36* (7), 58. Retrieved from ERIC database.

Swanson, H. L. (2001). Research on interventions for adolescents with learning disabilities: A meta-analysis of outcomes related to higher-order processing. *Elementary School Journal, 101*(3), 331. doi:10.1086/499671

Swinson, J. (2009). Review of Visible Learning: A synthesis of over 800 meta-analyses relating to achievement. *Educational Psychology in Practice, 25*(3), 287-288. doi: 10.1080/02667360903151916

Taylor, J. A., Van Scotter, P., & Coulson, D. (2007). Bridging research on learning and student achievement: The role of instructional materials. *Science Educator, 16*

(2), 44-50. (ERIC Document Reproduction Service No. EJ783420). Retrieved from ERIC database.

Thomas, E. (2007). Thoughtful planning fosters learning transfer. *Adult Learning, 18* (3-4), 4-8. Retrieved from ERIC database.

Thompson, M. (2007). Learning-focused school improvement model planning and implementation guide. Retrieved from http://www.learningfocused.com

Thompson, M. (2009a, 2008). Does Learning-Focused increase achievement? *The essentials: Learning-Focused addresses common misconceptions.* Retrieved August 1, 2009, from http://www.learningfocused.com/answers.php

Thompson, M. (2009b, 2008). Free resources. *Connections chronicles*. Retrieved August 23, 2009, from http://www.learningfocused.com/connections.php

Thompson, M. (2009c, 2008). Guiding questions. Retrieved August 1, 2009, from http://www.learningfocused.com/guiding-9.php

Thompson, M. (2009d, 2008). Implementation rubric. *Products and solutions: Implementation resources, implementation rubric*. Retrieved August 1, 2009, from http://www.learningfocused.com/implementation_rubric.php

Thompson, M. (2009e, 2008). Learning-Focused addresses common misconceptions. *The essentials*. Retrieved August 23, 2009, from http://www.learningfocused.com/answers.php

Thompson, M. (2009f, 2008). Learning-Focused preferred schools. *The essentials*. Retrieved August 1, 2009, from http://www.learningfocused.com/preferred.php

Thompson, M. (2009g, 2008). Learning-Focused research. *The essentials*. Retrieved August 16, 2009, from http://www.learningfocused.com/research.php

Thompson, M. (2009h, 2008). Learning-Focused Schools model references. *The essentials*. Retrieved August 23, 2009, from http://www.learningfocused.com/references.php

Thompson, M. (2009i, 2008). The Learning-Focused story. *About us*. Retrieved August 1, 2009, from http://www.learningfocused.com/story.php

Thompson, M. (2009j, 2008). Reviews of Learning-Focused. Retrieved August 1, 2009, from http://www.learningfocused.com/quotes.php

Thompson, M. (2009k, 2008). What is Learning-Focused? *Learning-Focused Connections Chronicles*. Retrieved August 1, 2009, from http://www.learningfocused.com/article.php?id=153&vw=3

Thompson, M., & Thomason, J. (2002). *Learning-Focused Schools strategies notebook*. Boone, NC: Learning Concepts Inc.

Thompson, R. A., & Zamboanga, B. L. (2004). Academic aptitude and prior knowledge as predictors of student achievement in introduction to psychology. *Journal of Educational Psychology, 96*(4), 778-784. doi:10.1037/0022-0663.96.4.778

Tomlinson, C. A. (2001). *How to differentiate instruction in mixed-ability classrooms* (2nd ed.). Alexandria, VA: Association for Supervision and Curriculum Development.

Tomlinson, C. A. (2005). Differentiating instruction: Why bother? *National Middle School Association*. (ERIC Document Reproduction Service No. ED497093). Retrieved from ERIC database.

Tomlinson, C. A. (2007). Learning to love assessment. *Educational Leadership, 65* (4), 8-13. Retrieved from Education Research Complete database.

U.S. Department of Education. (2002). Improving teacher quality state grants, Title II, Part A Non-regulartory guidance. Retrieved January 8, 2011, from http://public.doe.k12.ga.us

U.S. Department of Education. (2004, September 14, 2004). Choice and supplemental educational services frequently asked questions. *Choice for parents*. Retrieved December 20, 2010, from http://www.ed.gov/parents/schools/choice/choice.html

U.S. Department of Education. (2008, April 29, 2008 02:30 PM). Schools not making adequate yearly progress. Retrieved July 30, 2009, from http://answers.ed.gov/cgi-bin/education.cfg/php/enduser/std_adp.php?p_faqid=8&p_created=1095258227&p_sid=L_x86LDj&p_accessibility=0&p_redirect=&p_lva=&p_sp=cF9zcmNoPTEmcF9zb3J0X2J5PSZwX2dyaWRzb3J0PSZwX3Jvd19jbnQ9MTQsMTQmcF9wcm9kcz0mcF9jYXRzPTAmcF9wdj0mcF9jdj0mcF9wYWdlPTEmcF9zZWFyY2hfdGV4dD1hZGVxdWF0ZSB5ZWFybHkgcHJvZ3Jlc3M*&p_li=&p_topview=1

U.S. Department of Education. (2009a, July 1, 2009 01:46 PM). Adequate yearly progress. Retrieved August 2, 2009, 2009, from http://answers.ed.gov/cgi-bin/education.cfg/php/enduser/popup_adp.php?p_sid=L_x86LDj&p_lva=&p_li=

&p_faqid=6&p_created=1095256734&p_sp=cF9zcmNoPTEmcF9zb3J0X2J5PSZwX2dyaWRzb3J0PSZwX3Jvd19jbnQ9MTQsMTQmcF9wcm9kcz0mcF9jYXRzPTAmcF9wdj0mcF9jdj0mcF9wYWdlPTEmcF9zZWFyY2hfdGV4dD1hZGVxdWF0ZSB5ZWFybHkgcHJvZ3Jlc3M*

U.S. Department of Education. (2009b, September 7, 2003). Questions and answers on No Child Left Behind. Retrieved August 15, 2009, 2009, from http://www.ed.gov/nclb/accountability/schools/accountability.html#5

U.S. Department of Education. (2009c, 2007). State education data profiles. Retrieved August 15, 2009, from http://nces.ed.gov/programs/stateprofiles/sresult.asp?mode=full&displaycat=1&s1=13

U.S. Department of Education. (2009d, March 22, 2006). State profiles. Retrieved August 15, 2009, from http://nces.ed.gov/nationsreportcard/states/profile.asp

University of Wisconsin, S. P. (ND). Part VIII: Analysis of covariance (ANCOVA): Overview of the analysis of covariance. Retrieved March 3, 2010, from http://www.uwsp.edu/psych/cw/statmanual/ancovaoverview.html#TypesofExtraneousVariables

Usher, A. (2010). How many schools and districts have not made adequate yearly progress? Four year trends. Retrieved from http://www.cep-dc.org/cfcontent_file.cfm?Attachment=Usher%5FFourYearsAYPTrends%5F121610%2Epdf

Villa, R. A., Thousand, J. S., Nevin, A., & Liston, A. (2005). Successful inclusive practices in middle and secondary schools. *American Secondary Education, 33*

(3), 33. (ERIC Document Reproduction Service No. EJ697363). Retrieved from ERIC database.

Vosniadou, S. (2007). Conceptual change and education. [ERIC Document Reproduction Service]. *Human Development, 50*(1), 47. doi:10.1159/000097684

Wang, M. C., Haertel, G. D., & Walberg, H. J. (1993). Toward a knowledge base for school learning. *Review of Educational Research, 63*(3), 249-294. doi: 10.2307/00346543063003249

Weiss, I. R., & Pasley, J. D. (2004). What is high-quality instruction? *Educational Leadership, 61* (5), 24-28. Retrieved from Education Research Complete database.

Weissbourd, R. (2009). The schools we mean to be. *Educational Leadership, 66* (8), 26-31. Retrieved from Education Research Complete database.

What Works Clearinghouse (2008). First things first. What Works Clearinghouse intervention report. Retrieved from ERIC database.

Wiliam, D. (2007). Changing classroom practice. *Educational Leadership, 65* (4), 36-42. Retrieved from Education Research Complete database.

Williams, T., Kirst, M., & Haertel, E. (2005). Similar students, different results: Why do some schools do better? A large-scale survey of California elementary schools serving low-income students. Initial report of findings. Retrieved from ERIC database.

Wilson, S. M., Peterson, P. L., & National Education Association, W. D. C. (2006). Theories of learning and teaching: What do they mean for educators? Working paper. Retrieved from ERIC database.

Wright, A. W., & Bilica, K. (2007). Instructional tools to probe biology student's prior understanding. *American Biology Teacher, 69* (1), 1-5. Retrieved from Education Research Complete database.

Wright, S. P., Horn, S. P., & Sanders, W. L. (1997). Teacher and classroom context effects on student achievement: Implications for teacher evaluation. *Journal of Personnel Evaluation in Education, 11* (1), 57-67. Retrieved from PSYCH database.

Wyner, J. S., Bridgeland, J. M., & Dilulio, J. J., Jr. (2008). *Achievement trap: How America is failing millions of high-achieving students from lower-income families* (Report). Lansdowne, VA: Jack Kent Cooke Foundation. Retrieved from http://www.jackkentcookefoundation.org/jkcf_web/home.aspx?Page=Main.