

THE EFFECTS OF USING BLOOM'S TAXONOMY TO ALIGN READING
INSTRUCTION WITH THE VIRGINIA STANDARDS OF LEARNING
FRAMEWORK FOR ENGLISH

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The Effects of Using Bloom's Taxonomy to Align Reading
Instruction with the Virginia Standards of Learning Framework for English
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Charla Faulkner Crews. THE EFFECTS OF USING BLOOM'S TAXONOMY TO ALIGN READING INSTRUCTION WITH THE *VIRGINIA STANDARDS OF LEARNING* FRAMEWORK FOR ENGLISH (Under the direction of Dr. Scott B. Watson) School of Education, April 2010.

This study examined the effects of aligning the *Virginia Standards of Learning (SOL)* English Framework with Bloom's Taxonomy on student achievement. Changes prompted by *No Child Left Behind* legislation increased accountability for student success, as well as mandated testing to determine annual academic growth of all students. Documentation supported the need of fourth grade students to improve comprehension skills. The goals of this research were to determine the effects of aligning the *SOL* English Framework with Bloom's Taxonomy on student achievement and determine the effects of developing reading lesson plans based on the *SOL* English Framework aligned with Bloom's Taxonomy to consistently include higher order thinking skills. Fourth grade students in a rural, K-5 public school participated in the project for nine weeks which utilized a nonrandomized control group, pretest posttest design. Results determined no significant difference in scores between the two treatment groups existed; however, aligning Bloom's Taxonomy with the *SOL* English Framework had a positive effect on student scores when comparing the same students' pretest and posttest scores.

Keywords: Bloom's Taxonomy, comprehension, English Framework,
higher order thinking skills, *SOL*, *NCLB*

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“You raise me up, so I can stand on mountains;”

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“You raise me up...To more than I can be!!”

Dedication

“If ever there is tomorrow when we're not together. There is something you must always remember. You are braver than you believe, stronger than you seem, and smarter than you think. But the most important thing is, even if we're apart... I'll always be with you.”

-from *Winnie-the-Pooh*

This work is dedicated to those who help me remember through their legacies that a part of them will forever be with me.

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Chapter One: Introduction

Background of the Study

Accountability is prevalent in all facets of today's society. People in some of the most respected professions are often held to the highest degrees of accountability. Walker (2006) points out law enforcement officers are held responsible for their actions as individuals and as members of an agency. During the past thirty years, doctors and nurses have increasingly found themselves held accountable for their performance and quality of service. In many cases, patients are asking challenging questions of their health care professional based on information acquired by conducting Internet researches. In addition, everyone in the medical field must follow protocols such as *Health Insurance Portability and Accountability Act (HIPAA)* regulations and insurance company monitoring (Wells, 2007).

Educators are not exempt from society's scrutiny. A blog post by Donald Trump referred to a survey in which the majority of parents felt their children were receiving instruction in the wrong subjects (D Trump, 2008). Open scrutiny is not limited to reactions from parents and businessmen, but also students. The *2008 Speak Up* survey included students in grades kindergarten through 12. The survey revealed only 39 percent of the high school respondents believe they were being prepared for future jobs, especially with the use of technology ("Student survey", 2009).

Such scrutiny has elicited various responses from educators. One response by school divisions to the scrutiny is seeking accreditation from entities such as the Southern Association of Colleges and Schools. The process of accreditation includes school visits, documentation of adherence to certain standards, and a review by a team of educators to

determine if accreditation is warranted. In some cases, school divisions are placed on probation and are reevaluated every six months (Franklin, 2009). Another response to the scrutiny is the implementation of new or revised teacher licensure programs. Several states including Virginia have implemented rigorous teacher certification programs in response to legislation and school restructuring efforts (Claudet, 1999).

Some of the most across-the-board changes to American public education occurred with the enactment of the *No Child Left Behind Act of 2001 (NCLB)* (*No Child Left Behind*, 2001). This act was a revision of the *Elementary and Secondary Education Act of 1965*. Changes prompted by the *NCLB* legislation included increased accountability for student success at state and local levels, mandated testing to determine annual academic growth of all students, the requirement that school divisions employ highly-qualified personnel, and the use of research-based teaching strategies.

NCLB legislation required the implementation of statewide assessments of students in grades three through eight in reading and mathematics. The objective of the law was to ensure that all groups of students were making sufficient progress each year, known as Adequate Yearly Progress (AYP). A goal was set determining 100 percent proficiency would be reached within twelve years. The federal government set deadlines for school improvement, subjecting schools not in compliance to corrective and restructuring procedures (Johnston, 2001). Disaggregation of the assessment results were required to show the progress of five groups: gender, race, ethnicity, disability, and limited English proficiency. Personnel at all levels in school divisions are currently held accountable for the progress made by students in each subgroup.

High-stakes testing is used to monitor student progress and provide a means of accountability for the public educational system. In response, state education agencies

are developing standards-based academic programs that utilize a variety of standardized tests to monitor student achievement. Local school divisions must meet predetermined levels of achievement not only to maintain state accreditation, but also to stay in business.

By 2006, every state but Iowa had developed a standards-based academic program. Each of these programs used some type of testing to determine the extent the standards were being taught (Barth & Mitchell, 2006). Reports have predicted that in one year approximately 68 million standardized tests will be given to students in an effort to meet the requirements of *NCLB*. Other estimates have been given that students will take upwards of 100 million tests (Clarke, Madaus, Horn, & Ramos, 2000; Scherer, 2005).

The literature is replete with ways in which state and local education officials use the results of the tests. Decisions regarding development or changes to existing curricula are based on the data generated from the tests. In addition, accreditation of schools and divisions depend on students being successful on the high-stakes tests. In some cases, the results of the assessments can determine grade promotion or retention, as well as serve as exiting requirements from high school (Appropriate Use 2001; Barth & Mitchell, 2006; Clarke, Haney, & Madaus, 2000). A problem facing teachers is how to meet the needs of a diverse student body through the use of research-based instructional strategies as required by local, state, and federal mandates, while preparing them to be successful on high-stakes tests.

High-stakes testing and the issue of accountability have caused an examination of the current curricula selected or developed by school divisions. Instructional practices and the assessments used by classroom teachers also have been closely analyzed. *NCLB* requires the use of research-based instructional strategies; therefore, teachers must rely on

proven approaches to meet the needs of a diverse student body (*Research-based Instruction, 2009*).

Since the 1950's, Bloom's Taxonomy has been used to structure the thinking process in education. Later research supported the concept that the natural thinking process begins with the lower levels of the Taxonomy, and proceeds to the higher levels. Yet, subsequent research revealed that up to 90 percent of teaching occurs at the knowledge level, which is the lowest of Bloom's six levels (Davidson & Decker, 2006). Due to the revision of standards and tests, teachers must ensure that students are able to function at higher cognitive levels. Therefore, a need has surfaced to increase the use of higher order thinking skills by the students. Since many teachers only utilize the lower levels of cognitive thinking in their instruction, a paradigm shift in how teachers prepare and conduct their lessons must occur (Tankersley, n.d.; "The Critical Thinking Community", 2008). A challenge now faced by administrators is how to help teachers understand the need for instruction and assessment to spiral to the higher levels, since teaching at the higher levels encompasses the lower levels. A second challenge is to develop lessons containing the mandated content that advance towards the higher levels of the taxonomy in a manner that is not overwhelming to students or teachers.

Teachers are more conscious of providing students opportunities for success by developing multiple exposures to the required content based on the *Virginia Standards of Learning (SOL)*. Therefore, students must have opportunities to practice and apply the specific skills included in the assessment before the administration of the test. Students also should have opportunities to interact with the format of the test before attempting the actual assessment. These steps would ensure that students were not at a disadvantage due

to a lack of familiarity with the content and the testing process (Educational Testing Service, 2007; United States Department of State, n.d.).

One practice that has become popular among school divisions is the administration of benchmark tests. The premise for incorporating these tests into the academic program is two-fold. First, educators at all levels are provided a means by which to monitor student achievement at given intervals. Second, students are given the opportunity to practice test taking strategies as well as to become familiar with test formats before taking the actual high-stakes assessment. The tests monitor student academic improvement and are administered periodically during the school year. In most cases, end-of-year and state-wide assessments serve as models for the benchmark tests which are used as instructional tools (Linn, 2007; Scantron, 2006). Teachers and administrators receive the results from benchmark testing then use the data to make decisions which improve individual and group learning (Marsh, Pane, & Hamilton, 2006).

Public school students in the Commonwealth of Virginia began state-wide testing in the spring of 1998. The assessment program developed used as its foundation the *Virginia SOL* for all grades and courses taught in Virginia's public schools (*Standards of Learning*, n.d.). The version of the third grade English *SOL* test administered in 2000, contained questions that correlated to "low levels" of thinking. Based on Bloom's Taxonomy, the questions corresponded to the knowledge, comprehension, and lower application levels. A question from a *Standards of Learning* 2000 Released Test for third grade English asked students to identify a statement that named a presented picture (Commonwealth, 2000). Characteristics of the knowledge level of Bloom's Taxonomy

include observation and recall. Since the students only had to look at the picture to answer the question, this question qualified for Bloom's knowledge level.

The increased requirements of *NCLB* created a need to periodically review and revise the assessments used in the *Virginia Assessment Program*. Analysis of assessment revisions revealed the tests included questions requiring students to use analytical thinking skills. These higher order thinking questions also included items that necessitated the use of synthesis and evaluation skills, which are located at the higher levels of Bloom's Taxonomy. Classroom instruction and assessments constructed to incorporate higher levels of Bloom's Taxonomy would lead to the student using higher order thinking skills on a regular basis. As students use higher order thinking skills regularly, mandated test results improve. More importantly, reading skills that have been considered weak in American students are strengthened (Hendricks, 1995).

Statement of the Problem

Results from the *Nation's Report Card for Reading* (2007) reported on two areas of comprehension: reading for information and reading for literary experience. The results were then reported using the three achievement-levels described in Table 1.

Table 1

Nation's Report Card for Reading Achievement-Level Definitions

Basic	Partial mastery of prerequisite knowledge and skills that is fundamental for proficient work at each grade.
Proficient	Solid academic performance for each grade assessed. Students reaching this level have demonstrated competency over challenging subject matter, including subject-matter knowledge, application of such knowledge to real-world situations, and analytical skills appropriate to the subject matter.
Advanced	Superior performance.

The results of the study which covered a two year period from 2005 to 2007, documented that only eight percent of Virginia’s fourth graders were reading at an advanced level. The results also reported that 37 percent of the students were reading at the proficient level, while 72 percent of students were reading at the basic level (National Center, 2007).

The school division selected for this project administered a benchmark cumulative reading test during the fourth nine weeks of school to the fourth grade students. An examination of the fourth grade students’ average comprehension scores in the division revealed a need to improve reading comprehension. Table 2 uses the same achievement levels to show the levels of comprehension for fourth grade students over a two year period. The name of the school was changed to maintain anonymity and is known as The Elementary School throughout this project.

Table 2

Achievement Levels of Fourth Grade Students at The Elementary School

	2005-2006	2006-2007
Basic	44%	38%
Proficient	10%	10%
Advanced	47%	51%

The following is a correlation of the achievement levels used to the *Virginia SOL* test results.

- The *basic* achievement level is equivalent to not passing the *SOL* test.
- The *proficient* achievement level is equivalent to a “passed – proficient” score of 400-499 on the *SOL* test.

- The *advanced* achievement level is equivalent to a “passed – advanced” score of 500-600 on the *SOL* test.

Based on the results of the benchmark scores, gains were made. However, there still exists a need to improve fourth grade students’ comprehension in order to meet the requirements for state and national accreditation.

Purpose of Study

Due to the requirements of the *No Child Left Behind Act of 2001*, school divisions are required to show academic improvement, known as Adequate Yearly Progress (AYP). The progress must represent academic growth in subgroups of students. The subgroups include “all students, racial/ethnic groups, economically disadvantaged students, students with disabilities, and students with limited English proficiency” (United States Department of Education, 2003). As the assessments move toward the use of more analytical thinking, it is imperative that students in all subgroups are provided as many opportunities for success as possible. An understanding of the effective use of Bloom’s Taxonomy when planning instructional activities will enable teachers to determine strategies that will increase student use of higher order thinking skills.

SOL testing in Virginia began in the elementary school with grades three and five. The fourth grade was selected for this study because reading and mathematics assessments were recently added for that level. Analyses of the results from grades three and five over several years have revealed trends, possible areas of concern, and areas of success. Therefore, systems of analysis have been established for these grades. This study will allow educators to apply as well as build on the knowledge gained from third and fifth grade assessment results. The experiences of teachers who have become versed in making decisions based on classroom data can serve as a valuable resource. This study

will help define a process of educating a group of teachers on making data driven instructional decisions, many of whom are new to the testing arena.

Hypotheses

The goals of this research are to:

- determine the effects of aligning the *SOL English Framework* with Bloom's Taxonomy on student achievement; and
- determine the effects of developing reading lesson plans based on the *SOL English Framework* aligned with Bloom's Taxonomy.

Therefore, this research project was designed to explore the following null hypotheses:

Null Hypothesis 1: There will be no significant difference in the means of the third nine weeks Reading Benchmark Assessment for Grade Four posttest scores for the Experimental Group in which the teacher developed lessons using Bloom's Taxonomy than the means of the Control Group which uses traditional textbook bound instruction.

Null Hypothesis 2: There will be no significant difference in the mean scores of the Experimental Group in which the teacher developed lessons using Bloom's Taxonomy as measured by the difference between the pretest and the posttest scores on the third nine weeks Reading Benchmark Assessment for Grade Four.

The results of this research will aid administrators and teachers in addressing the needs of the students in each of the subgroups by providing a template for instructional planning that incorporates Bloom's Taxonomy with reading lessons. In addition, the results of this project will serve as a model for instructional staff development and continuous improvement through the creation of a staff development model that can be duplicated with minimal training.

Division administrators can use the results of this study as a strategy for schools not meeting the requirements of AYP or those in school improvement status. Building-level administrators might use this study as a source for implementing school-wide research-based strategies and action research. Teachers can use the results of this study as a springboard to differentiation of instruction by tailoring instruction to the unique needs of each child through the use of higher order thinking skills as an instructional component. Since the majority of curriculum is standards-based, teachers who learn to disaggregate classroom instructional data, reflect upon the results, and make instructional decisions based on those results will provide a quality education for each student in their charge. Moreover, teachers must determine those strategies that are most effective with a wide range of student abilities and backgrounds due to the diversity of the cultures present in all classrooms and the impetus of the current inclusion movement. The results of this research project will aid teachers in making the types of decisions that will improve classroom instruction.

Definition of Key Terms

Throughout this investigation, the following terms are used.

Academic Standards: “the skills and knowledge base expected of students for a particular

subject area at a particular grade level” (Indiana Department of Education, n.d.)

In Virginia, they are known as the *Standards of Learning (SOL)*.

Assessment: “measuring the learning and performance of students or teachers. Different

types of assessment instruments include achievement tests, minimum competency

tests, developmental screening tests, aptitude tests, observation instruments,

performance tasks, and authentic assessments” (ASCD, 2009a)

Adequate Yearly Progress: (AYP): “An individual state's measure of yearly progress toward achieving state academic standards. Adequate Yearly Progress is the minimum level of improvement that states, school districts and schools must achieve each year” (Ed.gov, 2004)

Benchmarks: “a standard for judging a performance” (ASCD, 2009b)

Bloom’s Taxonomy: “a classification of educational objectives developed in the 1950s by a group of researchers headed by Benjamin Bloom of the University of Chicago. Commonly refers to the objectives for the cognitive domain, which range from knowledge and comprehension (lowest) to synthesis and evaluation (highest)” (ASCD, 2009c)

Core Areas: four instructional areas – English, mathematics, science, and social sciences

Disaggregated Data: “Test scores or other data divided so that various categories can be compared” (ASCD, 2009d)

English: includes reading and written expression; English refers to *reading only* in grade four.

Higher Order Thinking: Those cognitive skills at the upper end of Bloom’s Taxonomy; generally considered to be analysis, synthesis, and evaluation

High Stakes Testing: “Tests used to determine which individual students get rewards, honors, or sanctions. Tests affecting the status of schools, such as those on which a given percentage of students must receive a passing grade, are also considered high stakes” (ASCD, 2009e)

Lesson Plan: an outline of goals and objectives, activities designed to help students achieve those goals, and objectives and ways to assess whether students have actually reached those goals and objectives (TeacherVision, 2009a)

Local Assessments: the Benchmark Assessments administered in the public school system in the four core areas; The tests are administered in Kindergarten through grade five at various times throughout the school year.

No Child Left Behind (NCLB): “NCLB's provisions represent a significant change in the federal government's influence in public schools and districts throughout the United States, in terms of assessment, accountability, and teacher quality. It increases the federal focus on the achievement of disadvantaged pupils, including English learners and students who live in poverty, provides funding for "innovative programs", and supports the right of parents to transfer their children to a different school if their school is low-performing (EdSource, 2009a)

Professional development: Also known as staff development, this term refers to experiences, such as attending conferences and workshops, that help teachers and administrators build knowledge and skills (ASCD, 2009f)

Reports Online System: Data disaggregator used by local school division to analyze benchmark and classroom assessment data

Scientifically-based Research: “Research that involves the application of rigorous, systemic, and objective procedures to obtain reliable and valid knowledge relevant to educational activities and programs” (EdSource, 2009b)

Standards-based Instruction: teachers use activities and lessons to ensure that students master a predetermined set of requirements or standards (TeacherVision, 2009b)

Social Sciences: refers to history, geography, civics, and economics;

State Assessments: the *Virginia SOL* tests administered in elementary school grades three, four, and five; tests are given in the four core areas at the end of the school year.

Tests for Higher Standards (TfHS): system of assessment developed by Dr. Stuart Flanagan to aid school divisions in developing benchmark assessments

Chapter Two: Literature Review

Introduction

Theoretical Perspectives.

All educators are guided by a belief system that determines a personal philosophy of education that serves as a basis for each educator's behavior. Lindgren (1959) eloquently explained the educator's personal philosophy was developed out of the "uniqueness of our experience and personality". While most educators would agree with Lindgren's statement, the influence of several learning theorists and theories on shaping education in America cannot be overlooked.

A cursory search reveals there is no shortage of learning theories or theorists. During the ten year period beginning in 1999, Kearsley documented over fifty theories of learning and teaching (2009). This literature review succinctly discusses the characteristics of three prominent theories – behaviorism, cognitivism, and constructivism, due to their common use in current instructional practices. A fourth theory, connectivism, also is discussed. This theory is currently utilized more with the inclusion of technology as a tool for learning.

Behaviorism.

John Watson and B.F. Skinner, both proponents of behaviorism, impacted instruction through their approach to teaching and learning. Shaffer (as cited in Standridge, 2002) explained the basis of Watson's work was to some extent based on the famous stimulus-response studies of Pavlov. Watson applied that belief to teaching by deducing that students presented with specific stimuli would respond with a particular behavior (Standridge, 2002).

During the 1950s and 1960s, Skinner augmented Watson's stimulus-response theory to include the concept of operant conditioning. Operant conditioning adds to the stimulus-response theory the concept of satisfying and unsatisfying responses. Skinner believed that rewarded responses would be repeated; while those responses not rewarded would be abated (Skinner, as cited in Standridge, 2002). Over the years, the behaviorist theory has evolved into four main tenets (Behavioral Theories, n.d.)

1. Students are taught skills and information in small parts.
2. Students need frequent feedback from their work to reinforce learning.
3. Students learn better if information and skills are taught in isolation to be applied later.
4. Students respond better to direct instruction that includes delivery methods such as lectures, tutorials, drills, and demonstrations.

The instructional delivery methods preferred by behaviorists continue to be used throughout classrooms at all levels of education. However, not all educators subscribed to those methods or beliefs. Another group of educators had a different approach to teaching and learning.

Cognitivism.

Jerome Bruner and Benjamin Bloom, both considered cognitivists, rejected the behaviorist belief that learning was no more than a response to stimuli. Instead, they believed that learning was a mental process that resulted in a change in behavior (Cognitivism, n.d.). One key point of the cognitive theory is that the learner interacts with the environment, and that interaction influences learning (Grider, 1993). Feedback plays a role in the cognitive theory as well as in the behaviorist theory. However,

whereas behaviorists are concerned with the application of feedback from an external source, cognitivists are concerned with internal feedback (Huitt, 2006).

Boston (2003) discussed the cognitive theory from the aspect of cognitive science that she explained as the study of how people think, learn, and use that knowledge to solve problems. She based her explanation on the cited work of Greeno, Collins, and Resnick as well as the National Research Council. She continued to discuss its application to education by stating how a learner develops knowledge about the subject matter and can demonstrate that knowledge at a proficient level. Boston offered specific suggestions for students such as the use of meta-cognitive skills and reflection strategies that cause the student to assess their own thinking.

Constructivism.

The concept of the student taking an active role in learning is one tenet of the learning theory known as constructivism. Theorists such as John Dewey, Jean Piaget and Lev Vygotsky believed that the learner constructs new knowledge based on previous learning and experiences. Dewey discarded the traditional methods of teaching such as memorization and recitation. Rather, he was an advocate of learning by doing (Duffy & Cunningham, 1996).

The work of Dewey, Piaget, and Vygotsky continued to influence American education during the reform efforts of the 1990's. Rogoff (1994) criticized educators for teaching in a manner that simply attempted to pour knowledge into the students rather than motivating them to want to learn (as cited in Duffy & Cunningham). Implications for classroom instruction based on the beliefs of constructivists involve changing the role of the teacher. Instead of the teacher being in charge or being considered the one who imparts knowledge, the teacher is one who facilitates learning. In addition, the teacher is

responsible for helping students access their prior learning and then use that learning to “build” new knowledge (Duffy & Cunningham, 1996; Hoover, 2009). A phrase describing the teacher’s role based on this theory is “not a sage on the stage, but a guide to the side”.

Connectivism.

An emerging learning theory attempts to account for the shifting manner that information is generated and distributed. Knowledge is growing exponentially. It has been estimated that half of what is known today did not exist ten years ago. In addition, it is believed that knowledge is currently doubling every eighteen months (Gonzalez, as cited in Siemens, 2005). Stephenson (n.d) explains how information is shared worldwide.

Experience has long been considered the best teacher of knowledge. Since we cannot experience everything, other people's experiences, and hence other people, become the surrogate for knowledge. 'I store my knowledge in my friends' is an axiom for collecting knowledge through collecting people.

The debate over the status of connectivism as a bona fide learning theory continues; however, Kerr (as cited in Kop and Hill, 2008) pinpoints two reasons for the development of a new theory. The first reason is older theories have become outdated. The second reason is a new theory builds on the older theory without discarding it, but attending to the new developments the older theory cannot explain. Connectivism appears to be justified as a learning theory by the second reason. Behaviorism, cognitivism, and constructivism each view the role of the teacher and learner from a different, although sometimes overlapping perspective. However, each is based on the principle that learning occurs inside the person. Connectivism views learning as a

process that occurs outside of the learner greatly affected by technology. It has been given the tag line of “the learning theory for the digital age” (Siemens, 2005). Kop and Hill (2008) explain the concept as knowledge that is activated by the learner by way of connecting and participating in a learning community. The learning community is known as a node that is always a part of a larger network.

Siemens (2005) provides the guiding principles of the theory.

1. Learning and knowledge rests in diversity of opinions.
2. Learning is a process of connecting specialized information sources.
3. Learning may reside in non-human appliances.
4. The capacity to know more is more important than what is now known.
5. Continual learning is facilitated by constantly nurturing and maintaining connections.
6. The ability to view connections between fields, ideas, and concepts is a core skill.
7. The intent of learning is currency – accurate, up-to-date knowledge.
8. Decision-making is a learning process. Incoming information must be analyzed as it correlates to a changing reality.

Connectivism is a model for learning that requires teachers and students to locate, analyze, synthesize, and evaluate massive amounts of data for accuracy, validity, and relevance. Information and knowledge are no longer considered entities to be attained, but tools to use to complete given tasks whether in learning or working environments. Kerr (as cited in Kop and Hill, 2008) states that connectivism requires internal processing that forces the learner to think deeply and create understanding.

Each of the models presented in this literature review provides a rationale to the current practices impacting classroom instruction. They also provide insight on why and how the roles of teachers and students have changed as well as why there are changing expectations for each from all educational stakeholders.

Former Expectations for Students and Teachers.

Each period in American education can be described by a catch phrase or word, as well as legislation that serve as a summary of that period. If one were to look back almost fifty years, great strides in education are evident in each decade. The 1960's were characterized by the Vietnam War, civil demonstrations, and calls for desegregation of American schools. Jeynes (2007) summed the era as the "Turbulence of the 1960's,"

Landmark legislation during the period included the *Vocational Facilities Act of 1963* and the *Higher Education Act of 1963*. These two pieces of legislation made available funds for student loans as well as the construction of facilities at the postsecondary level. Many postsecondary schools were able to construct libraries on their campuses due to this legislation. A renowned act that passed in 1965 was the *Elementary and Secondary Education Act (ESEA)*. This act was created to address the educational needs of children living in poverty. It was based on the premise that children whose parents' income determined they were living in poverty needed more educational services than children coming from homes where the parents' income was higher than the poverty level. A program started as a result of this legislation was Head Start that continues to provide educational opportunities for young children today (Schugurensky, 2002). *ESEA* became the forerunner of the *No Child Left Behind* legislation (National Technical Information Service, 1982). During that time, the expectations of schools and educators were to bridge racial discords and economical disparity, and teach all students.

The 1970's ushered in a new paradigm of equity. Concerns that minority high school graduation rates were as low as 40 percent in some areas, created a sense of competition between equity in education and quality of instruction (Perrone, 1985). Changes in the curriculum taught in schools encouraged inclusion of social issues and a deemphasizing of traditional curricula (Stout, 2000). Legislation during that time included the *Education for All Handicapped Children Act of 1975* that assured equal educational access to persons with disabilities. Evidence of maintaining the expectations from the 1960s transpired with the Supreme Court decision Swann v. Charlotte-Mecklenburg Board of Education (1971) which allowed bussing to be used by schools as a desegregation tool (Gillis, 1999).

While the turbulent '60s and the openness of the '70s brought about important changes in education, the 1980s and the 1990s completely changed the face of education. The impact of *A Nation at Risk*, a report developed by the bipartisan National Commission on Excellence in Education, continues to affect the decisions currently made in American education (National Commission, 1983). Due to this report, a renewed emphasis was placed on school reform. Spearheading the reform efforts were numerous committees created nationally (Cross & Islas, n.d.).

Prior to the 1990's, educational reform commonly meant monitoring and changing expectations for students based on grades and graduation and/or dropout rates. These expectations varied from state to state as well as within the state from division to division (Darling-Hammond, 1997, p. 7). However, some of the most sweeping legislation concerning education was based on the outcomes of the educational reform of the previous two decades. The *No Child Left Behind* legislation passed in 2001 mandated

the implementation of such changes as state-based standards, annual testing, and the establishment of mandatory annual benchmarks used to determine progress.

Changing Expectations for Students and Teachers.

Current trends in educational reform are creating paradigm shifts in both the expectations of teachers and student achievement. Despite the current financial crisis, and decreasing support for personnel, programs, and materials, stakeholders expect educators to continue meeting or exceeding predetermined levels of achievement. This success must occur in a cost-effective environment that is conducive to learning (*Analysis*, n.d.; Wagner & Kumar, 2009).

Stakeholders now expect more from students and teachers than ever before. Public Opinion Strategies and Hart Research Associates conducted a national poll taken of registered voters that revealed that 66 percent of the respondents believed that students needed skills other than just basic reading, mathematics, and writing. Eighty-eight percent of those responding believed that schools should be teaching critical thinking, problem solving, and communication skills (Partnership, 2007).

November discussed the need to prepare students for global competitiveness. He detailed three essential skills that students must attain: strategies to handle massive amounts of information, global communication skills practices in the classroom, and self-direction (November, 2007). With the realization that American students must be able to compete in the world market rather than a national market, educational reform took on a new façade. A challenge that continues to face educators is determining how to provide quality instruction under the restraints mandated by federal, state, and local legislation.

Current Expectations for Students and Teachers.

Current reform efforts are requiring all members of the educational community to

respond to rising expectations. The superintendent of Lockhart Independent School District in Texas published a document outlining the superintendent's expectations for teachers. Five categories were presented in which four of the areas address expectations of stakeholders. Listed below are several of the explanatory statements included (*LISD Superintendent's Expectations for New Teachers*, n.d.).

- “People are constantly watching and monitoring what you do or fail to do!”
- “Lifelong Learners Who Are Professional!”
- “You will look (dress, groom, speak) like a professional!”
- “We take the three most important assets families have to offer:
 1. Their Children
 2. Their Tax Dollars
 3. Their Trust

We cannot let them down!”

Lenz (2009) noted that once parents' concerns about testing and other academic concerns are addressed, the parents basically want to make sure that the educators are doing their best to make sure their children are learning what they need to be “happy, successful, good people”. A study conducted by the University of Michigan supported the observations of Lenz. Families from wealthier income levels were more concerned with their child's happiness at school, while families from high poverty levels were more interested in student achievement (Jacob & Lefgren, 2007).

Student achievement remained at the forefront of education in 2002 with the reauthorization of the *Elementary and Secondary Education Act (ESEA) of 1965*. This legislation became more commonly known as *No Child Left Behind (NCLB)*, and

established mandates that can be categorized into four areas of school and student improvement (*Four Pillars*, n.d.).

1. “Stronger accountability for results”
2. “More freedom for states and communities”
3. “Proven education results”
4. “More choices for parents”

The four mandates translate into practice through reforms that hold all educators accountable for student achievement. The Commission on Instructionally Supportive Assessment documented nine requirements for the development of assessments. Assessments created using the nine criteria will provide useful information concerning student learning, as well as serve as a means for holding schools and teachers accountable for student performance (The Commission, 2001).

According to Silver, Strong, Perini, & Tuculescu (2004), this is the third generation of accountability. The first generation concentrated on raising student achievement with the catchphrase, “every child can learn.” It became evident that while everyone could learn, there existed great variance in the levels of learning and the content that could be learned. Thus, the second generation dawned with goals or standards for learning. However, with the existence of goals it became inevitable that there must be measurements of goals, which led to mandated testing. The third generation as described by Silver, Strong, Perini, and Tuculescu is characterized by a challenge for educators to “to realize the dream unique to American Education: raising the levels of achievement for all students while still preserving the unique and precious gifts of each and every individual.”

In order to meet the challenge, many educators are being held to an accountability system that is comprised of several elements. Mathers noted five elements of accountability systems. They included standards, assessments, additional performance indicators, rewards, and sanctions (Mathers, 2001).

As a result of *NCLB* legislation, state and local districts are required to publish report cards so that the public can monitor and evaluate progress. Required report card components are Adequate Yearly Progress (AYP) status, highly qualified teacher information, student attendance and dropout rates, and student performance on standardized tests (State of New Jersey Department of Education, 2009).

This new level of accountability has changed the expectations of building administrators. Principals are expected to serve as instructional leaders basing instructional and resource allocation decisions on data collected from national, state, and local tests results. In some divisions, personnel decisions are made based on student achievement (Hamilton et al. 2007). Classroom teachers use the results of the tests to make decisions on both the content and pacing of instruction with the knowledge that stakeholders are monitoring test results. *NCLB* laws impacted the expectations of student achievement at the state level, as well as the local level. These regulations compel educators at all grade levels to monitor student progress and use data as the basis for all academic decisions.

Based on a study conducted by the Education Commission on the States (ECS), three types of data generally collected for use in making academic decisions were demographic, achievement, and instructional data. Six exemplary districts from five states collected that data, and participated in the study. Districts reported the information was useful in setting goals for instruction by providing information that identified each

division's strengths and weaknesses. Each district reported that the information provided was essential in improving teaching and learning (Education Commission, n.d.).

Data-Driven Decision Making (DDDM) not only leads to improvement in teaching and learning, but provides a resource for determining accountability (Marsh, Payne, and Hamilton, 2006). States and districts are required to divulge information on student progress in categories mandated by *NCLB*. Student results of reading and mathematics assessment scores must be included as well as the data for student subgroups to ensure that all children are making progress in meeting the state standards (*No Child Left Behind: Accountability*, 2008, NAEP Data). As a result, elementary and secondary educators' success continues to be based on student achievement. Tucker and Stronge (2005) propose that teacher evaluation rely on both classroom instruction and the learning gains of the students.

Other mandates include the release of data to the public revealing the progress of student subgroups in meeting predetermined achievement levels each year, known as AYP. Individual student progress also must be documented (*No Child Left Behind: Accountability*, 2008, Including Individual Student Growth; *No Child Left Behind: Accountability*, 2008, Minimize Subgroup). These data are used to evaluate the needs of the students and staff development needs of the teachers in the district. Additionally, the data drive reform and restructuring efforts, assessment formats, and identification of schools that need improvement (*No Child Left Behind: Accountability*, 2008, Assessment; *No Child Left Behind: Accountability*, 2008, Restructuring; *No Child Left Behind: Accountability*, 2008, Same Subject Identification). Marsh, et al. (2006) examined the results from the following studies: *Data-driven Decision Making in Southwestern Pennsylvania (SWPA) 2 2004–2005, Standards-Based Accountability, Instructional*

Improvement Efforts of Districts Partnered with the Institute for Learning (IFL) 3

2002–2005, and *Evaluation of Edison Schools 2000–2005*. The results from these four studies document ways that reform efforts have caused educators at all levels, especially classroom teachers, to use data to reevaluate their programs and practices, and then make decisions based on the conclusions drawn from that data. The studies cited encompassed various school settings such as urban and rural, as well as representing a cross section of national regions.

One of the modules in the *Teachscape XL: New Teacher Support Series* (Teachscape, 2009) addresses the question of why instructional decision making is important, discusses data analysis, and how to develop plans based on data that lead to student advancement. The process outlined in the module contains four steps that create a continuous cycle. The steps are: summarizing multiple assessments, creating a class profile, developing action plans, and keeping it going. The module encourages teachers to take the time to analyze the data and use these data to determine both individual and group needs. The success of current reform efforts largely rely on the daily decisions made by classroom teachers.

Along with the accountability factors, the qualifications for educational professionals have changed due to new federal regulations. Districts not only had to hire certified teachers but the expectation changed to having highly qualified personnel providing instruction. This greatly impacted many districts as they had to ensure that teachers were certified for the area in which they were providing instruction. Beginning with the 2005-2006 school year, *NCLB* required teachers in core content areas to be “highly qualified.” Core areas are mathematics, science, English, and social studies.

English includes oral language, reading, and writing; while social studies consists of history, government, geography, and economics.

The term “highly qualified,” which has become a buzzword in education since the passage of the *NCLB* legislation, refers to teachers who have completed specific requirements (Virginia Department of Education: Teacher Education and Licensure, 2005). Based on regulations of the United States Department of Education (US DOE), highly qualified teachers are those who have earned a bachelor’s degree, full state certification, and knowledge of the assigned teaching subject. The US DOE allows each state to determine in what manner a teacher proves they know the subject proficiency (US Department of Education: Fact Sheet, 2004).

The Commonwealth of Virginia has determined requirements for new and existing teachers. New teachers must be state licensed, hold a bachelor’s degree, and pass state tests. The tests required by the state are the Praxis II, and the Virginia Reading Assessment (VRA). Prior to 2006, Praxis I was one of the tests required by Virginia for licensure. However, Praxis I is now used as a Virginia Board of Education requirement for entry into Virginia’s approved teachers preparation programs. Praxis I and Praxis II evaluate general knowledge in reading, writing, and mathematics, as well as content knowledge, principals of teaching and learning, and teaching foundations respectively (Praxis Series: For Test Takers, 2009; Praxis Series: Praxis 1, 2009). The VRA measures a teacher’s knowledge to teach reading in grades preK-6 (Virginia Reading Assessment, 2007). Existing teachers are considered highly qualified if they are fully licensed with a current five-year renewable license, and satisfy one of two conditions. They must successfully pass a state subject test for elementary education or meet the High Objective Uniform State Standard of Evaluation (HOUSSE) definition. The HOUSSE definition for

Virginia has five options including taking state tests, completing 180 professional development points, and earning an advanced degree from an accredited college or university (Virginia Department of Education: Teacher Education and Licensure, 2005). In 2007, the HOUSSE requirements were revised to limit the use of the HOUSSE process for designating teachers as highly-qualified (Billy K. Cannaday, personal communication, February 23, 2007). This project was conducted at the elementary level; therefore, only the requirements for elementary teachers are noted.

Paraprofessionals, formerly known as aides, also had new qualifications to meet. In order to be considered highly qualified, paraprofessionals must either have an Associate's Degree or satisfactorily demonstrate general knowledge determined by their performance on the results of a paraprofessional test.

Darling-Hammond (as cited in Darling-Hammond, 1997) reported that more than 25 states have passed legislation to improve teacher quality, recruitment, education, and certification. In the same article Darling-Hammond provided evidence by Andrews, Blackmon, and Mackey (1980), as well as Ayers and Qualls (1979), to support that there were not strong nor consistent findings that prove the intelligence of the teacher had a positive impact on student achievement (as cited in Darling-Hammond, 2000). Findings were presented to show a strong, positive correlation to student achievement when teachers were able to use a "broad, repertoire of approaches" in addition to asking higher level thinking questions, and structuring material (Darling-Hammond, Wise, & Pease, 1983; Good & Brophy, 1986 as cited in Darling-Hammond 2000; Rosenshine & Furst, 1973).

Another entity that suggests high qualifications for teachers is the National Board of Professional Teaching Standards (NBPTS). This organization was created in 1987 and

became noted for the policy statement, What Teachers Should Know and Be Able to Do. The organization has five core propositions. The propositions denote characteristics of accomplished teachers. The propositions state that teachers are committed to their students and their learning; they know their content and how to teach it; they manage and monitor student learning; they are reflective persons who learn from experience; and they are members of learning communities (National Board, n.d.) The propositions mirror the requirements of what is considered highly qualified by the US DOE. Teachers pursuing this certification are often compensated by receiving financial assistance in paying for the process, earning financial rewards from their local or state education agencies as well as earning exemption from state certification. A memo from Virginia's Superintendent of Public Instruction, (Patricia I. Wright, personal communication, April 10, 2009) denoted subsidy grants to aid Virginia's teachers in pursuing National Board Certification. Compensation methods and amounts offered by states vary. Some states paid the \$2, 300 fee, some states offer financial incentives, while other states accept national certification as partial or total fulfillment for licensure renewal requirements (Lieberman, 2002).

A definition of highly qualified teachers offered by Glatthorn, Jones, and Bullock (2006) is intended to help readers better understand the concept. Their definition differs slightly from the one offered by the US DOE as Glatthorn, et al. suggests that competence is needed in three areas: quality learning, the science of teaching, and professionalism (Glatthorn, Jones, and Bullock, 2006, p. 3). Quality learning, according to the authors, is the goal of education and can be accomplished by highly qualified teachers. This position is supported by the work of Wallace (as cited in Wenglinsky, 2002), who as early as 1932, observed the impact of interaction between a teacher and the

student in the classroom. He observed the great difference that can occur in the student's knowledge and attitudes based on the classroom practices of the teacher.

Teachers have to wisely select sources of content, determine how to present that content effectively, and assess students' progress in relation to that content. According to Wong (n.d.), two hundred studies have investigated and the results supported the theory that significant gains in student achievement result when a "knowledgeable, skillful" teacher is making those decisions. His position is supported by Darling-Hammond (1997) who reports on the impact of teacher qualifications on student achievement. She asserts that after reviewing 60 studies "spending on teacher education swamped other variables as the most productive investment for schools." A study by Denton and Lacina (as cited in Darling-Hammond, 2000) concluded there is a positive relationship between professional education coursework, teaching performance, and student achievement.

Analysis of the 1992 and 1994 National Assessments of Educational Progress (NAEP) results found that fourth grade reading students whose teachers were fully certified, had a master's degree, and additional courses in literature-based instruction, made greater gains on reading assessments. The fully certified teachers also were found to use resources that encourage higher reading achievement such as library resources, trade books and literature, and the integration of reading and writing more than the use of workbooks and reading kits that have been linked to lower levels of achievement (Darling-Hammond, 2000).

Education is in many ways a kind of evolution. Over time, what we learn transforms us, elevating us to higher levels of thought and ability. And since educators are also lifelong learners, what they teach often evolves with what they learn. (Cho, 2009)

Cho's statement reveals an ongoing process of change in education. Teachers impact students intellectually and academically creating a cycle of role reversal. The teacher becomes the learner who is studying the effect of various methods they used in their instruction. As teachers learn about their students and the content they teach, they not only increase their knowledge base, but the knowledge base of their students.

This introduction has presented existing literature on standards-based education and the impact of teacher quality on student achievement. The remainder of this chapter discusses existing literature on curriculum, instruction, assessment, and curriculum alignment that are vital components to this study.

The Virginia Standards of Learning.

America's public schools once taught topics based on three themes: enculturation, socialization, and liberation. However, educators neither agreed on the most important theme nor the structure of the learning process. Over time, the structure of schools evolved into a system based on the students' age. Elementary and secondary categories emerged, later developing into hierarchies within each division. As more knowledge about students became available, research proved best practices for each age group (Wiles & Bondi, 2004). Many times these best practices were correlated to themes, topics, or content taught. The emerging curriculums often reflected the stakeholders' interests and concerns that lead to a plethora of topics being taught at different times (Tyler, 1981).

As students became more transient, the emergence of standards-based instruction helped to ensure that students in the same school division received exposure to the same content. Prior to this reform movement, the content taught in classrooms varied greatly. Teachers spent more time on material they enjoyed or knew well or content the students

enjoyed. As early as the 1950's states were developing documents to guide what knowledge and skills teachers were expected to teach at each grade level. Even as late as 2004, all states except Iowa had some type of standards that determined what students learned (Concept to Classroom, 2004). However, in many cases, mandated content was briefly taught, and in some cases, the teachers ignored the curriculum given to them to teach and it remained unopened in a desk or file drawer (Popham, 2003).

Two states, Virginia and Texas, were considered pacesetters in the development of state standards. The Texas Essential Knowledge and Skills (TEKS) assessments were implemented in 1998 as the state curriculum providing content for eighteen different program areas. These standards are updated periodically. As reported by the Texas Education Agency, the purpose of the TEKS provides "information and resources to ensure academic success of all students in Texas public schools" (Texas Education Agency: Curriculum, 2008).

The Virginia Department of Education (VDOE) responded to the need for a more equivalent minimum curriculum in 1995. The *SOL*, instituted under the leadership of Governor George Allen, were written to provide the "essential knowledge" students needed to be successful on the standardized tests given at the end of third, fourth, fifth, and eighth grades, as well as end-of-course tests administered for particular courses at the high school level (Rauchway & Altschuler, 2002). The standards in Virginia were developed based on a consensus of what stakeholders believed students should be taught and what they should learn (*Standards of Learning*, n.d.). Standards are now included in ten different program areas, encompassing a range of standards. For example, in the foreign language area, standards are provided for several different languages including French, German, Spanish, Latin, Modern Languages, and American Sign Language. The

SOL are reviewed and revised at least once every seven years based on a schedule developed by the Virginia Board of Education, to ensure a continuous process of evaluation of the standards (Standards of Learning, n.d.).

English standards are comprised of three strands: oral language, reading, and writing. Standards from each of these strands were divided into two reporting categories. The categories report on students' success in using word analysis strategies and information resources, and demonstrating comprehension of printed materials (Virginia Department of Education: Instructional Services (n.d.).

As established by the VDOE, the fourth through twelfth grade English curriculum expects students to apply and refine the skills learned as well as learn additional strategies to enhance the comprehension of various forms of literature. For the purposes of this project, only the fourth grade reading strand was examined. It is comprised of four objectives. The standards are designated as 4.3, .4.4, 4.5, and 4.6. The first number indicates the grade level and the second number indicates the standard. If the standard is further enumerated, a lowercase letter is added to the designation (See Appendix A) (*English Standards: Grade 4*, 2002).

The standards have been updated every seven years, and the revision in 2002 resulted in more precise assessments that required students to complete at least two steps to derive the correct answer. This is true for tests given in the four content areas: English, Mathematics, Science, and Social Sciences, and at each level of assessment. Additional test revisions have included more charts, tables, diagrams, and maps that allow for the measurement of higher thinking skills. (Released Tests 2001; Released Tests 2007). The revised English *SOL* were approved by the Virginia Board of Education in January 2010. However, for this study, the 2002 standards are used.

Mehrens and Lehmann (1973) suggest that these types of items, *context-dependent items*, are more suitable for assessing complex skills. Before students can be successful on assessments requiring the use of higher order skills, they must be prepared for the assessments, which add importance to reading content.

The Virginia Standards of Learning Framework.

The Commonwealth of Virginia enlisted the help of educators at all levels to develop a document to aid school divisions in developing curriculum closely aligned to the *SOL* assessments. The *SOL* Curriculum Framework (the Framework) provided all stakeholders an in-depth guidance to the *SOL*, and is not intended to be a complete curriculum, but to ensure that students in the Commonwealth of Virginia receive the same minimum education. It is on this foundation that school divisions and teachers should plan the instruction, curriculum, and assessments for the students (Virginia Department of Education: Curriculum Alignment, n.d.).

The document contained the standards as well as additional information divided into the three categories: “Understanding the Standards” (teacher’s background knowledge), “Essential Understandings”, and “Essential Knowledge, Skills, and Processes”. Each category provides pertinent information for teachers to use in daily instruction. “Understanding the Standard” provides vocabulary, definitions, and clarifies the information that will be assessed. An important component of the “essential Knowledge” category is that it provides specifics for basic skills. *SOL 2.4a* calls for students to know and use consonant digraphs. The Framework makes teachers aware that four specific digraphs could be on the assessment. (*English Standards: Grade 2*, 2002).

District and building administrators as well as classroom teachers found themselves participating in a process to “unpack” or delineate the Framework in order to better understand content (Daughtry, McDaniel, & Smith, n.d.). “Unpacking” the Framework reveals that skills at each of the six levels of Bloom’s Taxonomy are included. Teachers using the Framework will find themselves teaching at the higher levels of the Taxonomy because of the variation in the skills. Unpacking the fourth grade reading Framework revealed the use of over eleven different verbs such as: compare, construct, describe, distinguish, draw conclusions, evaluate, explain, formulate, identify, summarize, synthesize, and use (English Standards of Learning Framework, 2002). A survey of the fourth grade reading *SOL* Framework yielded the following frequencies of verbs used. Table 3 illustrates a comparison of the verbs used in the Framework to the corresponding level of verbs in Bloom’s Taxonomy (Bloom’s Taxonomy Action Verbs, n.d.; *English Standards: Grade 4, 2002*; Outcome Verbs, n.d.).

Table 3

Correlation of Framework Verbs to Bloom’s Taxonomy Verbs

Framework Verb	Frequency	Level on Bloom’s Taxonomy
Identify		Knowledge
Describe		Comprehension
Explain		Comprehension
Summarize		Comprehension
Use		Application
Compare		Analysis
Distinguish		Analysis
Infer		Analysis
Conclude		Analysis
Construct		Synthesis
Formulate		Synthesis
Evaluate		Evaluate

The process of unpacking the *SOL* as suggested by Emberger (2007) utilizes the Understanding by Design Three-Circle Audit. Three questions are answered to prioritize the content:

1. What is worth being familiar with? (outer circle)
2. What should all students know and be able to do? (middle circle)
3. What are the enduring understandings students should explore and acquire?
(center circle)

Another process for unpacking the *SOL* involves twelve instructional strategies. One of the strategies calls for teachers to closely analyze each standard to determine the instructional target. In addition to determining the teaching target of the standard, the cognitive level of the standard must be determined. Eight of the twelve strategies correlate student outcomes directly to levels of Bloom's Taxonomy. The remaining four strategies require the teacher to engage students in higher level thinking during instruction (Stiff-Williams, 2002).

Instruction

Implications for Reading Instruction.

Teaching students to read has been a responsibility of the teacher for hundreds of years. It is the foundation on which the system of education is built. During the eighteenth century the main purpose of schools was to teach students to read Latin. In fact, it would be difficult for one to find many people that disagree with the following statement: "If people want to be productive, they need to understand the world and the opportunities that it presents. To do this, they must be able to learn. To learn, one must be able to read" (History, 2004). While many may agree with the statement, few agree on how to teach students to read. This has been an ongoing debate for more than 100

years. The National Reading Panel (NRP) released its landmark report, *The Report of the National Reading Panel: Teaching Children to Read* in 2000. This report was based on the findings of assessing research-based reading instruction approaches. Based on the findings, the NRP found that students must be taught certain skills to become productive readers. Those skills included: phonemic awareness, phonics, fluency, and comprehension (National Institute of Child Health, 2000).

The section of the report of interest to this study is comprehension instruction. Two of the three necessary components of reading comprehension as noted by the NRP, provide support for this project. The first component noted was the role of vocabulary development and vocabulary instruction in comprehension. A second component is the concept that comprehension is an interactive process that occurs between the reader and the text. The last component is that teacher preparation in reading instruction is directly linked to student achievement (National Institute of Child Health, 2000).

A long-standing myth states that kindergarten through third grade students learn to read, while beginning at fourth grade, students read to learn. Research has proven that students in upper elementary need opportunities to refine comprehension skills, exposure to a variety of literature, practice decoding multisyllabic words as well as words of Latin and Greek origin. In addition upper elementary students need opportunities that enable them to continue expanding their vocabulary (Robb, n.d.).

Fountas and Pinnell (2006) discuss comprehension as the essential core of “the broader more complex ability to reason” rather than a product or goal of reading. They continue the discussion by describing the difference between literacy and comprehending. According to Fountas and Pinnell, literacy is “a network of in-the-head processes in which the reader gains a variety of information while reading and then builds

the author's meaning" (p.4). Comprehension is using the in-the-head processes to make meaning and occurs before, during, and after reading. Aiding comprehension is "a student's understanding of genre that sets the rules and expectations in the reader's mind and helps build meaning" (p.139).

Pearson & Duke (2002) support Fountas & Pinnell's discussion on the complexity of comprehension. They describe comprehension as a complex process in which the reader interacts with different texts for a variety of reasons. An example of this process is based on the schema theory. The schema theory views reading as an active process and that readers connect old knowledge to the new information they gained from the text.

Comprehension as an interactive process depends solely on the reader acting and reacting to the text. A deliberate teaching of strategies that provides the reader with the means of such interaction empowers the reader to gain a greater understanding of what was read. Teachers must be trained in the comprehension processes and strategies that have proven to be effective. Beyond training, the teacher must adopt the attitude of the adage "actions speak louder than words". Students must view the strategies in action. Teachers must model using the strategies. Wilson (2005) noted in *Teaching Reading: A History*, enthusiasm, ability, and energy of the teacher was more important than a certain teaching method in the success of teaching students to read.

One component of *NCLB* requires teachers to employ research-based instructional strategies. Local Education Agencies (LEAs) therefore had to evaluate their guides for instruction. The National Reading Panel's (NRP) document "Reading First" shaped a national stage for reading instruction. Based on the results of the NRP's research, a common vocabulary, a verified source for research-based strategies, and a focus for

teaching reading were provided. Five components were presented as the areas in which children must be taught and learn to be successful readers. The five components were:

- Phonemic awareness
- Phonics
- Vocabulary Development
- Comprehension
- Fluency.

Given these five areas, educators were challenged to change their thinking about reading instruction to include researched-based, successful skills and strategies. The goal is to help students become successful readers (Armbruster, Lehr, & Osborn, 2003). The panel recommended the goal of teaching reading is to develop strategic readers. Often cited were strategies that successful readers used routinely. Comprehension strategies recommended for use included the “before, during, and after” reading strategy. This particular strategy helps students access their prior knowledge throughout the reading process. A mental framework on which new knowledge can be connected also is provided (North Central Educational Laboratory, n.d.; Pennsylvania Department of Education, 2008).

Another method or strategy of helping students become successful readers is differentiation of instruction. Educators have been known to differ on whether differentiation is a strategy or approach to instruction. When implemented, differentiation is based on meeting learner needs through options for student interaction with content, process, and/or product (Hall, 2002). Therefore, for the purposes of this project, differentiation is considered an implemented strategy.

Brailey & Ashley (2007) explained a method of instruction known as co-teaching. This method enables teachers and paraprofessionals give students more individualized help. The forms of co-teaching are “one teach/one observe”, “station teaching”, “parallel teaching”, “alternative teaching”, “teaming”, and “one teach/one assist”. The most prevalent of the six are “station teaching”, “parallel teaching”, and “one teach/one assist.”

The strategy of making connections to the text was introduced by Robert Marzano. Students learn to connect personally to the selection they are reading by making three types of connections – text to text, text to self, text to world. Each type of connection requires students to explain their relationship with the information. Dwyer and Igoe conducted a study examining the effect of personalization on students’ comprehension in the ninth, tenth, and eleventh grades. Personalization occurs when teachers and students assimilate concepts and information being taught based on their prior knowledge and experiences. Results from the study revealed that personalization of reading material increased student comprehension (Dwyer & Igoe, 1992). Each of these strategies allows students to access prior learning and experience and apply those to a new situation. Ultimately, both strategies enable students to function at the higher ends of Bloom’s Taxonomy that ensures greater comprehension of the material.

Effective questioning is another strategy proven to aid students in comprehension. The questions have to challenge student thinking; however, rather than train students to answer rote questions that could be classified at Bloom’s lower levels. Jones, Harland, Reid, and Bartlett (2009) conducted a study to determine the relationship between the cognitive level of examination questions and learner outcomes, and student performance.

Bloom’s Taxonomy was selected for the study. Each level of Bloom’s Taxonomy was described based on the types of questions relative to the level. Knowledge questions

were based on the student being able to recall and remember facts or information previously taught. Students were required to rephrase into their own words, as well as interpret charts, graphs, tables, and cartoons in order to answer comprehension questions. Application questions required students to identify information and apply the rules to algorithms. The analysis level of questioning expected students to separate information into parts, and then display an understanding of the relationship of the parts to the whole. The fifth level, synthesis, allowed students to develop and complete a plan or experiment. This level also could require students to write a paper. The highest level, evaluation, required students to use the other five levels to make judgments based on the information, idea, or problem to be solved. Third and fourth year college students were participants in the study. The results of the study revealed that some instructors were creating examination questions to match the cognitive skills taught, but more work in the area was needed.

Demand for Higher Order Thinking Skills Instruction.

As children grow and develop, certain levels of thinking occur naturally. However, Nickerson (1988, as cited in Nagappan, 2000) suggests that students do not often think as effectively as possible. Nagappan then asserts that the goal of an educator is to improve the quality of students' thinking so that they are able to think more effectively. He considered skills such as thinking deeply, consistently, and more productively are to improve the quality of thinking. In addition, he proposes that due to the advances in technologies, a student must be able to think critically, not just able to read, to be considered literate (Nagappan, 2000). Brady (2008) concurred by stating that students must move past memorization to develop a full range of thinking skills that they need to deal with the complex issues of their world. He continues supporting his position

by comparing the societal changes made between different generations. His conclusion was that the adaptations students need to function in a world of changing realities necessitate the use of higher order thinking skills.

This concern for the quality of thinking is not new. As early as 1984, several statewide initiatives were underway in Vermont, California, Maryland, and New Jersey to incorporate thinking skills into their curriculums. The city of Pittsburgh, concerned with increasing thinking skills, created a program that stressed skills at the upper levels of Bloom's taxonomy such as summarizing and evaluating. During that same time, Bloom's taxonomy was the basis for incorporating process skills into the curriculum in Baltimore, MD (Presseisen, 1984).

Created in 1956 by Benjamin Bloom and his associates as an instrument to classify the important thinking behaviors required in the learning process, the taxonomy has been used for fifty years, translated into 22 languages, and is one of the most cited references used in education (Forehand, 2005). There are six levels of the taxonomy that begin at lower levels of thinking known as knowledge and comprehension. The next levels are application and analysis, and progresses to require more complex, divergent thinking at the highest levels of synthesis and evaluation (Bloom & Krathwohl, 1956). Bloom's Taxonomy is often described by a group of verbs for each level which specify the type of student behavior expected for that level. A general explanation of the taxonomy is "tasks move from simpler to complex, from observable to concrete to abstract, and from working with known materials to the creation of new materials or approaches" (Presseisen, 1984).

Using Bloom's taxonomy in the development of the curriculum ensures that the skills taught include the full range of the taxonomy. Results from the National

Assessment of Educational Progress (NAEP) administered in 2000 found that 37 percent of fourth graders were reading below the basic level. Readers at that level received a score up to 208, and were able to gain an overall understanding of what they read, but were not able to function at higher levels of comprehension. A comparison of scores obtained by different ethnic groups revealed that the average score of Caucasian students was 226 or the proficient level. Students scoring in the proficient level gained an overall understanding of the passage and were able to provide inferential and literal information. Black students attained an average score of 193; Hispanic students' average score was 197; and American Indians average score was 196. The highest average score, 232, was obtained by Asian/Pacific Islander students. A score of 239 was needed to move to the advanced level (National Institute for Literacy, 2008).

Raths (2002) noted that Carroll's model of school learning helped educators determine if instruction had improved. He concluded that improved instruction could be reasonably inferred if the complexity of lesson objectives increases across lessons or units.

The American Educational Research Association discussed the importance of increasing the "cognitive demand" in high school mathematics classes. The premise was presented that certain groups of students were not being challenged in a way that promoted higher-level thinking, which lead to an inability to compete for positions requiring the use of higher mathematics skills such as engineering and technology. The information presented was based on an American College Testing (ACT) study that included seven countries, one of which was the United States. The study proved that the "same levels of mathematics skills were required for the workforce and college", and this in turn led to the conclusion that a greater level of cognitive demand in the mathematics

classes taken by all students was needed (Resnick, 2006). Pollock (2007) supported this concept when calling for the “use of a well-articulated curriculum” that includes robust concepts, generalizations and procedures as opposed to statements of objectives. In addition, Tankersley (2005) applied the same concepts to reading by stating that students who engage in higher-order thinking are able to make insightful conclusions, inferences, and use their knowledge in new situations.

The article concluded by reiterating three main points:

- Cognitive demand must be raised in the curriculum to enhance student skills for career preparation.
- Teaching mathematics at higher cognitive levels in the early grades provides a brighter outlook for the future of diverse populations.
- A learning environment must be created that supports both basic skills and tasks that require higher cognitive demand.

The information presented in the article is relevant to this research as it proves the impact of higher cognitive skills on student learning, as well as connecting the curriculum to the higher cognitive skills.

While studies have proven the effectiveness of higher order skills in improving student achievement, a challenge continues to be convincing teachers to change their pedagogy and teaching styles to include instruction, strategies and opportunities for students to apply high level thinking skills. Bloom (as cited in Jones, Harland, Reid, and Bartlett, 2009) commented that teachers asked questions at the knowledge level 80 to 90 percent of the time. He acknowledged that these questions are valuable to learning, but students need to interact with questions at higher levels because the higher level questions require “more brain power and more extensive and elaborate answers.”

In many classrooms, teachers continue to consistently teach at the lower levels of the taxonomy, never requiring students to delve into the content at the level required to reach the higher levels of thinking. Quint, Akey, Rappaport, and Willner (2007) found in a study of 49 third- and fourth-grade teachers and principals that it was rare for students to be impelled to analyze their work, make judgments for their responses, or evaluate their responses during class discussions. The result is that students do not learn nor experience the process of the mental calisthenics used in higher order thinking (Schwebel, Schwebel, Schwebel, & Schwebel, 1996). This finding was supported in the average score of Academic Rigor indicating that third- and fourth-grade students who participated in the study seldom functioned past basic summaries and superficial answers to questions (Quint et al., 2007). Schwebel, et al. (1996) suggested that students actually enjoy the challenge of working at the higher levels of Bloom's taxonomy, provided it is compatible with their conceptual state of development.

Patsalides, in sharing from her personal experiences of trying to implement all levels of the taxonomy in a kindergarten classroom, noted that teachers often teach at the lower levels of the taxonomy – knowledge, comprehension, and application (Patsalides, 2008). Even at the postsecondary level, it was found that college undergraduates remember little of what they learned in high school science classes. The lack of understanding was attributed to the lack of time spent on application and analysis as opposed to the students being assessed on their ability to recall and summarize the information presented (Lord & Baviskar, 2007).

Brady (2008) posed the idea that educators have been seeking the wrong information from students by asking "What do you remember?" He presents the premise that educators should be asking questions such as:

1. What's going on here?
2. Why?
3. Where is it likely to take us?
4. What should we be doing?

Analysis of the sample questions cause the students to think at the higher levels of Bloom's Taxonomy such as analysis, synthesis, and evaluation.

Teaching higher order thinking skills that are integrated into the content takes time and energy. Many teachers would prefer to use multiple choice tests and memorization of facts because they are much easier to implement (Carr, 1990). McMillan (as cited in Carr, 1990) stated that "It really boils down to whether teachers are creating an environment that stimulates critical inquiry."

The environment of the classroom is determined by the central element -- the teacher. The environment should be flexible so that different types of activities can be planned, as well as arranged to motivate students. The elementary classroom should be a place where students can achieve the planned objectives and behavior problems are minimized. The classroom environment has been compared to an extra teacher (*Scholastic*, 2009).

Effective Instructional Lesson Plans.

Traditional lesson plans have been used for more than forty years. Generally, they are completed by teachers and usually are a detailed schedule of daily activities (Nerbovig & Klausmeier, 1962). Kagan and Tippins (1992) conducted a study on the lesson plan formats used by twelve elementary and secondary student teachers.

Implications from the study found that traditional lesson plans were counterproductive to both groups of student teachers. Researchers suggested that the teachers should use a

format that allowed them to individualize the lesson plan with as many or as few details needed.

Novice teachers typically join the ranks of teachers who use the “fill-in-the-block” lesson plan form. These forms do not compel teachers to think through the teaching process in the same way required by detailed formats. In many cases, the product is a brief, one sentence description of what will occur in class. By contrast, lesson plans should enable a teacher to effectively communicate content to students (Kizlik, 2008b). The lesson plans should aid the teacher in creating the optimal learning environment, preparing for classroom management of the lesson or activity, formulate specific learning experiences, denote needed materials, and utilize time effectively (Nerbovig & Klausmeier, 1962). The results of effective lesson plans include greater student success, higher student test scores, improved retention, and a better attitude towards school (Burke, 2002).

Wong & Wong (2005) suggest that the “greater the structure of a lesson and the more precise the directions on what is to be accomplished, the higher the achievement” (p.218-219). Wong & Wong further suggest that preciseness can be achieved by telling the students exactly what they are expected to accomplish using verbs or thinking words that are based on Bloom’s taxonomy. Each level of the taxonomy provides verbs that will advance students to higher levels of thinking. These thinking words should be used in the lesson objectives.

Teachers must be able to think, plan, and teach at the higher cognitive levels if they expect their students to operate at those levels. An analysis of teachers’ reactions to planning and teaching at higher levels of thinking revealed that they found themselves thinking at higher levels. Through the planning and teaching process teachers

specifically stated, “they had to think beyond the basics because they wanted their students to do likewise” (Sparapani, 1999, p. 6.). The use of Bloom’s Taxonomy as a scaffold for planning lessons permits the teacher to systematically teach the content at the advancing degrees of complexity.

Changing the lesson plan format to align to Bloom’s Taxonomy will provide a format for building higher order thinking skills into the lesson based on the required content. Lesson plans serve as a guide or road map to helping children achieve a desired learning outcome (*Developing the Lesson Plan*, n.d.; Kizlik, 2008a).

Chappius (2007) in addressing the topic of development of a division-wide policy on lesson plans affirmed that the alignment of classroom instruction with the expectations of a school division should be documented through the teacher’s lesson plan. He continued to say that those plans should be completed before class targeting three areas: lesson content, assessment, and purpose. The lesson plans should be tightly linked to state and division standards since there is a proven correlation between the written curriculum and the taught curriculum.

Assessment

Student assessment continues to be a major component of education. In ancient times, the *Socratic Method* was used to ascertain student progress as well as determine what the content needed to be for future lessons (*Socratic Questions*, n.d.). Teachers continue to use assessments to determine if a taught skill or concept has been learned (Brualdi, 1998).

While the rationale for student assessment has not changed over time, the purpose, quantity, and format of asking students questions has changed since the time of Socrates. Scherer reports that American students will take approximately 68 million tests

in one year to meet the requirements of *NCLB* (Scherer, 2005). The results of high stakes testing are currently used to measure a student's level of knowledge to academic standards (Heubert & Hauser, 1999). Due to the fact that these tests are used to measure the student performance and to hold school districts, schools, and teachers accountable, they are considered high-stakes tests (American Psychological, 2007).

Educators agree that the purpose of assessments is to improve student learning by providing a crucial link between effective teaching, student learning, and academic standards (Extract, n.d.; Roeber, 1995). Teachers, students, and parents depend on classroom assessments as measures of student progress. In addition, policymakers at all levels now depend on high-stakes assessment results to drive their decisions (Scherer, 2005).

The types of assessments given in classrooms have continued to evolve into precise tools that accurately measure student achievement. Multiple-choice tests are commonly used because of their versatility in question creation and choice. As early as 1945, Mosier, Myers, & Price discussed fourteen types of questions that could be assessed with multiple choice tests. (Mosier, Myers, & Price, 1945) Beginning in the 1960's, the National Assessment of Educational Progress began using multiple choice instruments to test students nationwide in reading. The passing of *NCLB* caused stakeholders to continue to rely on high-stakes multiple choice testing to determine adequate yearly progress. The tests now given in reading have been refined to address areas of vocabulary, as well as literal and inferential comprehension (Afflerbach, 2007). The National Assessment of Education Process Test examines three areas of reading: reading for literary purpose, information, and to perform a task (Tankersley, 2005).

In an attempt to prepare students for state testing, many school divisions are purchasing or creating benchmark tests to provide students chances to interact with the format of tests before taking the mandated assessments. Kozlowski, Bekkering, & Jones (2006) outlined a procedure through which college instructors can create multiple choice assessments that include questions comprised from all levels of Bloom's Taxonomy. The process used a bank of test questions provided by the textbook company in addition to questions written by some of the instructors.

Assessment of the state standards was needed to fulfill the federally mandated requirements for testing. *NCLB* requires states to determine every child's progress in reading and mathematics annually in grades 3 through 8. Student assessments are required at least once during grades 10 through 12. States are required to continue meeting the directives published in the reauthorizing of the *Improving America's Schools Act of 1994 (ESEA)*. *ESEA* mandated assessments in reading and mathematics at three grade spans (3-5; 6-9; and 10-12). In addition, mandated timelines were designed to include required assessments of science, and students with limited English proficiency (US Department of Education: Stronger Accountability, 2003).

The Commonwealth of Virginia met the mandated assessment requirements through the development of the *SOL* assessment program. *SOL* tests are administered each spring at the elementary and middle school levels, and at the end of certain courses at the high school level. Students in grades 3, 5, and 8 are tested annually using an assessment based on the *SOL* created for each grade in four core areas: English, mathematics, science, and social studies. Students in grade 4 are assessed in reading and mathematics, and writing at grades 5 and 8. Assessments at the high school level are

given at the end of courses (EOC) for which standards have been developed. In addition, an EOC assessment is given before a student exits English 11.

The assessments are based on the blueprints given to the test constructors ensuring that all stakeholders understand the expectations. The assessment blueprints make available to the public information about the tests such as test construction, the length of the tests, and the number of field test items on each test. They also correlate the reporting categories to the *SOL* (Virginia Department of Education: Instructional Services, n.d.). The tests vary in length, are untimed, and range in number of questions from a low of 30 questions to a high of 60 questions. Each test contains several field test questions so that a bank of questions is constantly being updated to maintain test validity and reliability.

The original assessments began in 1999 with questions that demanded basic knowledge of four content areas. These tests consisted mostly of questions that could be answered by simple recall or by looking back into the passage. More precise assessments are now being used at every level. With each revision, the tests have become more analytical and require the students to incorporate higher levels of thinking to be successful. With the revisions of the assessments over the past five years, many of the questions on the assessments have required students to complete at least two steps to derive the correct answer. This is true for tests given in the four content areas. Additional test revisions have included more charts, tables, diagrams, and maps that allow for the measurement of higher thinking skills.

The English assessment increased in complexity as well. More difficult reading texts were implemented as students advanced in school. In addition, reading skills spiraled upward with each grade and those skills were subsumed in grades kindergarten

through three (Technical Assistance Document, 2005). Examples of increasing complexity are found in the comparison of a 2001 and a 2007 third grade reading test. The 2001 test consisted of three reading passages that averaged 142 words each. One selection was a poem, and the remaining two selections were fiction passages. The 2007 test consisted of four passages. One passage was a recipe, and another was a nonfiction selection. Two selections were in the genre of realistic fiction. The passages from the 2007 test averaged 331 words each. There were 189 more words on the 2007 test than on the 2001 test. Therefore, students were required to read and comprehend a greater quantity of more complex information (Released Tests 2001; Released Tests 2007).

Educators then evaluate the results of those assessments to determine the effectiveness of instructional strategies, as well as a course of direction for future instruction (Brissenden & Slater, n.d.). Teachers can assist students in learning to think at higher levels and be successful on high stakes tests by ensuring that classroom instruction, the curriculum, and all assessments are aligned not only in content and format but also in levels of complexity. “Learning outcomes in this area [evaluation] are highest in the cognitive hierarchy because they contain elements of all the other categories, plus conscious value judgments on clearly defined criteria” (Carneson, Delpierre, & Masters, n.d.). Tankersley (2005) suggests that students only can do well on high-stakes tests when they know how to think, which occurs in reading when students can synthesize, analyze, evaluate, and interpret information. In an essay commissioned by the National Center on Education and the Economy, it was noted that alignment of the curriculum, instruction, and assessment would constitute a triad in which teaching and learning were driven by a scope and breadth of skills and knowledge of content or subject matter using

various methods and activities, which then assessed the actual curriculum taught (Pellegrino, 2006).

Curriculum Alignment

Timeline of Curriculum Alignment.

Curriculum alignment has been prevalent in education since the 1960's and early 1970's. During this time teachers started to base their lesson plans on behavioral objectives according to Mager (as cited in Liebling, 1997). Greatly influenced by the work of Bloom's Taxonomy, early attempts at curriculum alignment were "intended to make a clear connection between the assessments content and instructional content" (Liebling, 1997). Due to the creation of a large number of objectives, teachers rejected this approach.

In the late 1970's and early 1980's many districts moved away from aligning the curriculum to Bloom's Taxonomy and focused their efforts on aligning the districts curriculum to textbook objectives. The basis of textbook objectives was generally the objectives of standardized achievement tests. Administrators then learned to analyze the results to determine areas of strengths and weaknesses (Liebling, 1997). The emphasis of curriculum alignment was refocused because of increased accountability and the implementation of state standards. Since that time, alignment has centered on three components: content, instruction, and assessment (March, 1997; Pankratz & Petrosko, 2000).

Effectiveness of Curriculum Alignment.

Several studies have proven that curriculum alignment improves student achievement. Cohen (as cited in Edvantia, 2005) examined doctoral dissertation studies conducted by four of his students. He concluded that when instruction and assessment

were aligned, not only did high-aptitude students do well, but also low-aptitude students did well. Rath (2002) in reflecting on Carroll's model of school learning (1963) noted that one could infer evidence of improved instruction if the assignment of activities and assessments were more closely aligned to the lesson's objectives that would lead to student learning. .

Wishnick (as cited in Edvantia, 2005) noted that factors such as socioeconomic status, gender, and teacher effect lost their impact when curriculum and assessment were aligned. Mitchell (1999) conducted a study to determine an aligned curriculum's impact on student achievement. More than 4,000 third grade students in one school district were involved. Research results were similar to that of previous studies. The students gained a mean of 5.12 points in mathematics when given the IOWA standardized test. Curriculum alignment was therefore, considered an effective strategy to increase student achievement.

Smith and Gillespie (2007) reported on several sources that identified the importance of curriculum alignment in adult basic education (ABE). This report was referenced at the Massachusetts Department of Education's Adult Basic Education Directors Meeting. A panel of educators presented information on aligning the Massachusetts ABE Curriculum Framework with English as Second Language (ESOL) and ABE program curricula (Massachusetts Department of Education, 2007).

EdSource, a 30 year old, independent, non-profit policy organization, conducted research in 257 California elementary schools. The student populations of each school were similar. Many students had a low socioeconomic status (SES) or parents struggling with the English language. Some parents did not have a high school degree or any formal education past high school. The research results determined that these students made the

greatest gains by aligning lessons with the California standards (EdSource, 2005). An analysis of international studies revealed that a gain of 31 percentile points was made when an aligned curriculum was implemented. In addition, other studies concluded that alignment eliminated factors such as socioeconomic status and teacher effect in student achievement (The Benefits, 2004).

Educational agencies and organizations have made curriculum alignment a priority. The Association for Supervision and Curriculum Development offers a professional development course, *Crafting Curriculum*. Two out of six lessons are devoted to the topic of aligning and linking the curriculum (*Crafting Curriculum*, 2003). Lesson two addresses the topic of aligning the curriculum with a focus on three concepts:

1. types of curriculum;
2. issues related to aligning curriculum; and
3. characteristics of a quality curriculum.

Eight types of curriculum are included in the lesson; however, Glatthorn stated that the most important curriculum alignment is between the taught and learned curriculum (Glatthorn, 1999). “Linking curriculum, instruction, and assessment” is the focus of lesson six. Course participants learn how to identify instructional approaches that support the curriculum, as well as ways to use assessments for curriculum support.

The Alabama Department of Education designed a website enabling their educators’ asynchronous participation in professional development modules. One module addresses the need for aligning curriculum, instruction, and assessment. The curriculum alignment module describes the purpose of alignment. “Teachers need to be skilled in aligning all of these elements so that the assessment provides an accurate

reflection of the student's accomplishments and an effective indicator of the teacher's success" (Alabama, 2003).

The North Carolina State Department of Education wanted to ensure *The Standard Course of Study* served as the basis for instruction. Across the state, teachers learned how to align curriculum. Then they worked together aligning their district's written, taught, and tested curriculum. Resources and time used on unaligned lessons to the mandated content were discouraged because the lessons did not prepare the students for the tested material (Curriculum Alignment, 1999).

Virginia's General Assembly authorized the *Standards of Quality* that required the Board of Education to "establish objectives, revise them periodically, and assess them to determine the levels of student achievement". The *Standards of Quality* also require local school boards to "implement the objectives" (22.1-253.13:1). Curriculum Alignment Indicators for written, taught, and assessed curriculum were developed.

Conclusion

Accountability of Educators.

The *No Child Left Behind* legislation brought sweeping changes to how schools, districts, and states were evaluated and earned accreditation. Accreditation requirements under *NCLB* were based on testing, Adequate Yearly Progress (AYP), and teacher quality. Two areas of the accreditation requirements have a direct impact on this study -- testing and teacher quality.

Schools at the elementary level must continue to account for student retention and misbehavior, but also demonstrate predetermined levels of growth based on student results to standards-based assessments. Educators at all levels are expected to use researched-based strategies proven to be effective. In addition, teachers in the

Commonwealth of Virginia, find themselves being held accountable for teaching the *SOL* Framework as opposed to teaching the textbook to guarantee students are prepared for the assessments. As a result, for educators in the Commonwealth, the only assurance that test data can provide an accurate reflection of student progress continues to be ensuring classroom instruction is aligned with the standards.

Administrators at all levels find themselves being held accountable for teacher and student success. Superintendents risk the loss of essential federal and state funding if *NCLB* benchmarks are not met. District level administrators now find themselves being held accountable for curriculum and personnel decisions that effect the decisions made by building level administrators.

Purpose of Project.

The purpose of this project was to determine the effect of aligning Bloom's Taxonomy to the Virginia Department of Education's *SOL* Framework for reading instruction in the fourth grade. The premise for this project was to determine if a tight alignment will help teachers and students experience greater success by working smarter rather than harder in the teaching and learning process. Corroboration presented in the literature supports the concept that students, who engage in higher-level thinking skills, are better prepared to think and perform more effectively on standardized tests. Evidence also was provided to support the premise that teachers need to improve as well as increase their use of higher order thinking skills in their instruction.

A survey of the literature confirms that curriculum alignment can have a positive effect on student achievement. This survey of literature also provided examples of researched-based strategies and classroom teaching structures that support student advancement.

This project examines the impact that alignment has on student achievement as measured by results on the third nine week benchmark assessment given in a fourth grade reading class. In addition, the project aligns *SOL* framework with the higher order thinking skill taxonomy developed by Benjamin Bloom (Bloom & Krathwohl, 1956), and relies on division-wide benchmark tests to assess achievement.

Chapter Three: Methodology

Higher academic expectations are being required of students and teachers. The need to meet and exceed these expectations is requiring teachers to change their paradigm concerning teaching to mastery. Replacing this train of thought is the concept of teaching students to think at higher cognitive levels. It is essential that students have opportunities to learn the content they will experience on mandated state assessments at higher cognitive levels. No research was found that connected the use of higher levels of thinking as structured in Bloom's Taxonomy with the specific content of the Virginia Department of Education's *English Standards of Learning Framework* to classroom instruction as documented through a teacher's lesson plans. Therefore, this study was conducted to provide valuable data determining the effectiveness of making that connection.

The data for this project were reported using percentages and displayed in a combination of narrative text, tables, and graphs. The project was designed to study the question: "Will the practice of having teachers specifically develop lessons and assessments using Bloom's Taxonomy as a guide affect scores on the fourth grade Virginia Reading Assessment?" The data generated by the project were analyzed using Microsoft Excel, Statistical Package for Social Sciences (SPSS[®]), and the ReportsOnline System (ROS) for data disaggregation. Two null hypotheses were developed for this project.

Null Hypothesis 1: There will be no significant difference in the means of the third nine weeks Reading Benchmark Assessment for Grade Four posttest scores for the Experimental Group in which the teacher developed lessons using

Bloom's Taxonomy than the means of the Control Group which uses traditional textbook bound instruction.

Null Hypothesis 2: There will be no significant difference in the mean scores of the Experimental Group in which the teacher developed lessons using Bloom's Taxonomy as measured by the difference between the pretest and the posttest scores on the third nine weeks Reading Benchmark Assessment for Grade Four.

This chapter describes the methodology and procedures used in this project. The chapter also contains a description of the data analysis process employed. Information regarding the location and people involved in the study is also provided. The name of the school was changed to maintain anonymity and is known as The Elementary School.

Sample and Participants

Prior to the start of each school year, the principal assigns students to each class. Classes are grouped heterogeneously, as students are assigned based on creating a balance in gender, race, disability, and teacher recommendation of ability. In addition, the principal strives to ensure that the students do not move grade to grade as an intact group. It also should be noted that the principal prefers the students to have a least one person they know in the class. The process for determining class assignments was completed before the principal was aware the project would take place at that school.

Therefore, there was no bias that would affect this project. Total random assignment of students was not possible. This research project implemented a Nonrandomized Control Group, Pretest-Posttest Design.

The study was conducted over a nine-week period, beginning in January 2008 and ending in March 2008. This time period was considered the third nine-week session for the participating school division, which will be known as the Division to maintain

confidentiality and anonymity. The Division served 6,100 students, who lived in one of seven attendance zones.

The Elementary School served the largest geographical area in the county. Nineteen school buses and four Division cars transported students daily. In addition, parents and other relatives transported over 100 students by private vehicles each day. A principal and assistant principal provided building level leadership for 642 students in grades kindergarten through five. The principal was an administrative veteran of seven years; the assistant principal was new to administration.

There were five classrooms at each grade level. Grade level chairpersons were utilized to help disseminate information pertinent to the school within each grade. The students at the school maintained a 97 percent attendance rate and the school had a free and reduced meal rate of 26 percent.

The support staff included two cafeteria managers who supervised 11 food service workers. Four secretaries in the main office filled the positions of receptionist, bookkeeper, general secretary, and maintaining the student information system for the school.

The student population was comprised of three ethnic groups: Blacks, Caucasians, and Hispanics. This racial distribution was 29 percent Black, 69 percent Caucasian, and 2 percent Hispanic. Gender distribution was balanced within each ethnic group. There were 15 percent Black Females, 14 percent Black males, 33 percent Caucasian females, 36 percent Caucasian males, and one percent each of Hispanic females and males. The majority of the students came from medial socio-economic backgrounds and two parent homes.

The fourth grade contained a total of 116 students. The two classes selected for the project were reading classes taught by two different experienced teachers. The Experimental Group consisted of 23 students. The teacher assigned to this class had 35 years of teaching experience. Prior to the 2007-2008 school year, all of the teacher's experience had been at the same school in the Division. It was the oldest of the four schools closed, and had never achieved accreditation. In addition, the teacher had a licensure endorsement for developmental reading and reading specialist. Despite her background, she had chosen to remain in the classroom without pursuing positions such as reading specialist or instructional coach. She did share her concern because this was the first time she had taught in a structure that was not self-contained. The students with special needs were not a part of this group due to the requirements of their Individualized Educational Plan (IEP).

The Control Group also consisted of twenty-three students. There was one student with special needs who was a part of this group whose IEP mandated participation in a collaborative setting. The teacher for the Control Group had taught at the elementary level for eleven years with a licensure endorsement in library science. This teacher had taught in two schools that were fully accredited. This teacher always had taught in a departmentalized scheduling structure and was comfortable with changing classes.

The students were in the fourth grade at The Elementary School. There were five sections of heterogeneously grouped fourth grade classes, with two reading classes. The sections were divided into two teams consisting of a three-way rotation and a two-way rotation. The Division mandated that times for reading blocks be protected. Therefore, reading blocks at all elementary schools were scheduled for 60 uninterrupted minutes. Both reading teachers taught more than one fourth grade section. In each case, the

students in the study represented their homerooms, which were selected because they had an equal number of students, and both were taught in the afternoon.

Instrumentation

The Division utilized Benchmark Assessments developed in conjunction with the Tests for Higher Standards (TfHS) (Mott, 2001). Forms A and B of the Benchmark Assessment for Fourth Grade were used as a pretest/posttest. Both forms were identical assessments with the exception of a cosmetic change on the cover of each test which included changing the form identification, and removing the border that was used routinely on the Division's Benchmark tests. A model for the test was the *Virginia SOL Reading Assessment for Grade Four*. The *SOL* test contained thirty-four multiple choice questions based on four selections. The passages ranged in readability from 4.2 to 5.4. The average readability of the tests was 5.0.

The Benchmark Assessments used contained thirty-four questions based on three selections. The selections covered a variety of genres including fiction, nonfiction, and poetry. The multiple choice questions utilized the same format as the *SOL* tests in regards to font, layout, and selection for answer choices.

The readability of each passage on the Benchmark test was determined by using the same procedure used to determine readability of the *Virginia SOL Test for Fourth Grade*. The selections ranged in readability from 3.9 to 7.6. The average readability of the tests was 5.9.

According to Mott, (Mott, 2001) the *TfHS Pre-Post Test* scores in grade 5 had a 0.95 correlation with scaled scores on Virginia's *SOL Test*. The TfHS had the following

reliability coefficients at grade 5. (See Table 4) The Spearman/Brown formula was used to adjust for differences in test lengths.

Table 4

Reliability Coefficients at Grade 5

Reading	Writing	Mathematics	Science	History
.87	.74	.86	.88	.79

The *Virginia SOL* requires a passing score of 400 out of a possible 600. This equates to a pass percentage of 67 percent. When comparing previous 5th grade Benchmark and *SOL* scores from the Division by equating the scores to the passing rate, the Benchmark scores were consistently lower. (See Table 5)

Table 5

Comparison of 5th Grade Passing Rates Benchmark and SOL Scores

	Benchmark Passing Rate	<i>SOL</i> Score Passing Rate	Comparison of scores
2005-2006	36%	83%	47% more students passed the <i>SOL</i> test than the Benchmark test.
2006-2007	63%	84%	21% more students passed the <i>SOL</i> test than the Benchmark test.

The same trends noted in the fifth grade comparison were noted in the fourth grade comparison. For that reason, it was determined that the test was reliable to use for the fourth grade. (See Table 6)

Table 6

Comparison of 4th Grade Passing Rates Benchmark and SOL Scores

	Benchmark Passing Rate	SOL Score Passing Rate	Comparison of scores
2005-2006	55%	81%	26% more students passed the <i>SOL</i> test than the Benchmark test.
2006-2007	64%	78%	17% more students passed the <i>SOL</i> test than the Benchmark test.

Validity of the assessment was ascertained by analyzing the content to determine the correlation of the assessment with the *Virginia SOL*. Test Blueprints developed by the Virginia Department of Education (VDOE) were used to determine the content for both tests (Mott, 2001). When examined, the fourth grade test was developed based on the VDOE's blueprint. Items excluded from testing on the *SOL* assessment also were excluded from the Benchmark tests. Items excluded were those determined by the VDOE to be unrealistic to test in a multiple choice format.

Procedures

Prior to beginning the project, the Division approved and supported the project by approving the school selected, and agreeing to employ a substitute so that the teacher of the Experimental Group could participate in a full day of training. The Division's support also included division-wide access to the data reporting system and permission to request use of the meeting room at a local technology center that partners with the school system. Therefore, the training for the Experimental Group occurred off-campus and was conducted on the first day of the third nine weeks. The researcher, who was considered the liaison for the project, conducted the training.

During the first day of training, the teacher was introduced to the premise of the project, mandatory lesson plan format, purpose of the teacher journal, and was required to complete confidentiality and testing affidavits. The teacher was specifically informed not to share materials, strategies, or skills learned during the training with any other teachers. The teacher of the Control Group was told that her grade level was participating in an educational project, and materials were going to be provided to the other reading teacher. It was explained to the teacher that if materials proved helpful, they would be shared with all teachers at the end of the project.

Initial training covered an extensive review of the VDOE Framework for 4th Grade Reading, Bloom's Taxonomy, and the mandated lesson plan format were explained in detail. Each component of the lesson plan correlated to either the Framework or Bloom's Taxonomy, with the exception of descriptive information. Descriptive information included lesson number, subject, teacher's name, grade, and lesson duration, technology integration, materials needed, additional resources, overview, and administrator's objective. Table 7 explains the correlations of the lesson plan components. The teacher of the Control Group did not participate in any training.

Table 7

Correlation: Lesson Plan Components to VDOE Framework and Bloom's Taxonomy

	VDOE Framework	Bloom's Taxonomy
<i>SOL</i> Objectives		Levels based on verbs used in teacher and student activities.
Teacher Activities	Activities based directly on the Framework denoting <i>SOL</i> to be taught	Lessons and activities were correlated and spiraled up to appropriate levels of Bloom's Taxonomy
Student Activities	Activities completed by students. Objectives written in student friendly terms.	
Procedures	Teacher and student actions	
Verification	Six methods for validating the teacher is relaying information and students are receiving the planned content	
Differentiation Flexible Groups	Six strategies for differentiating the content Student groups based on instructional needs; Activities planned to meet those needs	
Assessment Method	Six methods of assessing students	
Collaboration	Reinforcement/extension/remediation taught by another member of the staff	
Literature Connection	Additional selections that reinforce/extend/remediate the content	

Students in both groups were given Form A (Pretest) of the Division's Benchmark Assessment on the same day. The assessment occurred on the second day of the second semester. The results were not shared with either of the classroom teachers. Parents were informed of the project via an announcement that appeared in the school's bi-monthly newsletter. Appendix B is a copy of the announcement.

The teacher of the Experimental Group received instruction twice a month on strategies for aligning the *SOL* Framework with Bloom's Taxonomy to include higher level thinking skill strategies in reading lessons. A total of eight sessions were held at the school after students were dismissed. The teacher also received at least four reading lessons per week that utilized higher level thinking skills for the entire third nine weeks. Lesson plans were designed with a skill spiral to ensure student exposure to the content included all levels of Bloom's Taxonomy. Many of the ancillary materials from the current textbook were incorporated in the lesson. The students were given Form B (Posttest) of the Division's Benchmark Assessment on the forty-third day of the nine week period (45 days).

Data Analysis

The results of the pretest and the posttest were scanned using the Reports Online System (ROS). The scanned tests were made available in one of four traditional ROS reports: Item Analysis, Matrix Report, Progress Report, or Multi-category Report. The disaggregator allowed data to be reported in several ways, such as in counts, by percentages, or in several grouping configurations. An Analysis of Covariance (ANCOVA) was used to determine the statistical significance between the scores the Experimental Group and the Control Group. A dependent samples t-test was used to determine the statistical difference between the pretest and posttest scores of the Experimental Group.

Chapter Four: Results

Introduction

As presented in Chapter 1, there is a need to improve fourth grade students' reading comprehension scores if the Division is to continue meeting the requirements for state and national accreditation. This problem is prevalent not only with the division participating in this study, but across the nation as benchmarks continue to rise based on the requirements of the *No Child Left Behind* legislation. A quantitative investigation conducted involving fourth grade students from an elementary school in a rural, Virginia community yielded the results for this project. This study examined the effects of aligning the *Virginia SOL* English Framework with Bloom's Taxonomy on student achievement. Therefore, this research project explored the following null hypotheses:

Null Hypothesis 1: There will be no significant difference in the means of the third nine weeks Reading Benchmark Assessment for Grade Four posttest scores for the Experimental Group in which the teacher developed lessons using Bloom's Taxonomy than the means of the control group which uses traditional textbook bound instruction.

Null Hypothesis 2: There will be no significant difference in the mean scores of the experimental group in which the teacher developed lessons using Bloom's Taxonomy as measured by the difference between the pretest and the posttest scores on the third nine weeks Reading Benchmark Assessment for Grade Four.

Chapter Four describes the results yielded from this project and are presented as they relate to the proposed hypotheses. Data from this project were disaggregated using Microsoft Excel, Reports Online System (ROS) and SPSS[®] computer programs. Measures of central tendency were computed to summarize the data for the pretests and posttests.

Participants

This research project, conducted over a nine week period, implemented a Nonrandomized Control Group, Pretest-Posttest Design. Participants were fourth grade reading students in a rural school. An experienced reading teacher taught each of the two classes selected for the project.

The Experimental Group consisted of 23 students when the class was selected for participation. Results for this project were based on the student scores of 19 students in the Experimental Group. During the administration of the pretest, three students were absent. One student was absent during the posttest. In each case, the school schedule deemed it unfeasible to administer a make-up test due to student illness, inclement weather, and school-wide activities.

The Control Group was comprised of 23 students. One student with special needs was a member of this group since the current individualized education plan (IEP) mandated participation in a collaborative setting. During the time of the project, two students in this group moved and withdrew from the school. One student was absent during the posttest. Again, make-up testing was not feasible. Therefore, the data examined includes the results of 20 students in the Control Group.

Disaggregated Data

Benchmark Data Results.

The Experimental Group participated in lessons designed by aligning Bloom's Taxonomy to the content mandated in the *SOL* English Framework for Fourth Grade. Only those *SOL* designated in the reading category were included in this study. The Control Group received reading instruction based on the more traditional method of teaching reading based on the textbook. While the *SOL* English Framework was used

with the Control Group because of its mandated use by the school division, it was not taught in-depth nor aligned to Bloom's Taxonomy.

Both groups completed a 34 question pretest. The highest available score was 100. Table 8 shows the mean pretest score results from both treatment groups. The Control Group earned a higher mean score than the Experimental Group on the pretest.

Table 8

Mean Pretest Scores on Benchmark Assessment

	n	Mean	Median	Range
Experimental Group	19	72.32	74	47
Control Group	20	75.75	78	36

The posttest given to both groups consisted of 34 items, with the highest score available 100. Table 9 shows the posttest mean score for each group. Based on the results of the mean posttest scores, the Experimental Group gained 9.79 points, while the mean score of the Control Group increased by 7.65 points. The median score of the Experimental Group increased by eleven points; while the median score of Control Group increased by four points.

Table 9

Mean Posttest Scores on Benchmark Assessment

	n	Mean	Median	Range
Experimental Group	19	82.11	85.00	71
Control Group	20	83.40	82.00	29

The Division used the Benchmark test score results as a predictor for English *SOL* tests. Division guidelines set a passing score at 70. This was known as the cut score. The passing score was also used to determine a class's passing rate. The Division calculated the passing rate by dividing the number of students passing the test by the

number of students taking the assessment. The Experimental Group had a 58 percent increase in the number of students who passed the posttest. The Control Group had an increase of 33 percent in the number of students who passed the posttest. Table 10 shows the Benchmark pretest results for both groups. Table 11 shows the Benchmark posttest results for both groups.

Table 10

Benchmark Pretest Results for the Experimental Group and the Control Group

	Number of Passing Scores (passing score= 70)	Passing Rate
Experimental Group	10	53%
Control Group	15	75%

Table 11

Benchmark Posttest Results for the Experimental Group and the Control Group

	Number of Passing Scores (passing score= 70)	Passing Rate
Experimental Group	16	84%
Control Group	20	100%

Statistical Data

Analysis of Covariance (ANCOVA) Results.

Levene's Test for Equality of Variances determined the significance level for the dependent variable to be .112, which is considered not significant. Therefore, the assumption of equal variance was met. (See Table 12)

Table 12

Results of Levene's Test of Equality of Error Variances

Dependent Variable: Posttest

<i>F</i>	<i>df1</i>	<i>df2</i>	<i>Sig.</i>
2.646	1	37	.112

The analysis of covariance (ANCOVA) adjusted the group means on the pretest and the degree to which it affected the posttest means. Of particular interest was the change in gains made by the Experimental Group after adjustments were made for pretest differences. When conducting the ANCOVA, pretest scores served as the covariate, the dependent variable was the posttest scores, and the group served as the fixed factor/independent variable.

The ANCOVA results analyzed the mean posttest scores and revealed the differences in the posttest scores were not statistically significant between the groups, $F(1,36)=.169$, $p =.683$. ANCOVA results are shown in Table 13. An alpha level of 0.05 was used for all statistical tests.

The adjusted R square as shown in Table 13 accounted for 44 percent of the variance in posttest scores. A regression analysis supported the finding that there was no significant difference in the means of the third nine weeks Reading Benchmark Assessment for the treatment group in which the teacher developed lessons using Bloom's Taxonomy than the means of the group whose teacher used traditional, textbook bound instruction.

Table 13

ANCOVA Summary

Dependent Variable: Posttest

Source	<i>df</i>	<i>MS</i>	<i>F</i>	<i>Sig.</i>
Corrected Model	2	1622.460	15.950	.000
Intercept	1	651.478	6.404	.016
Pretest	1	3228.586	31.739	.000
Group	1	17.230	.169	.683
Error	36	101.722		
Total	39			

a R Squared = .470 (Adjusted R Squared = .440)

t-Test Results.

A dependent samples t-Test determined the statistical difference between the posttest and pretest scores of the Experimental Group. Results from the *t*-Test confirmed a significant gain between the pretest (*Mean*=72.32, *SD*=14.74) and posttest scores (*Mean*=82.11, *SD*=17.36); $t(19)=3.224$, $p<.05$. The scores of students in the Experimental Group increased on the posttest by a sample means difference of 9.79 points. This indicates that aligning the *SOL* Framework to Bloom's Taxonomy had a positive effect on students' posttest scores. Table 14 presents the results used in the analysis.

Table 14

t-Test Results for the Experimental Group

Variable	n	M	SD	t	df	p
Pair 1 Posttest	19	82.11	17.36	3.224	18	.005
Pretest	19	72.32	14.74			

Findings in Relation to Proposed Hypotheses

Null Hypothesis 1: There will be no significant difference in the means of the third nine weeks Reading Benchmark Assessment for Grade Four posttest scores for the Experimental Group in which the teacher developed lessons using Bloom's Taxonomy than the means of the Control Group which uses traditional textbook bound instruction.

ANCOVA results determined no significant difference in mean posttest scores occurred. Therefore, Null Hypothesis 1 was retained. The unadjusted mean for the Experimental Group (*Mean* = 82.11, *SD* = 17.36) was not higher than the unadjusted mean for Group 2 (*Mean* = 83.40, *SD* = 8.78). Adjusted gains for the Experimental

Group did demonstrate greater gains than the Control Group. Table 15 displays the unadjusted and adjusted means for both groups.

Table 15

Adjusted and Unadjusted Mean Posttest Scores on Benchmark Assessment

	Unadjusted Mean	Adjusted Mean
Experimental Group	82.11	83.46
Control Group	83.40	82.12

Null Hypothesis 2: There will be no significant difference in the mean scores of the experimental group in which the teacher developed lessons using Bloom's Taxonomy as measured by the difference between the pretest and the posttest scores on the third nine weeks Reading Benchmark Assessment for Grade Four.

Based on the results, Null Hypothesis 2 was rejected. The Experimental Group, the group in which the teacher developed lessons using Bloom's Taxonomy and aligned to the *SOL* Framework, earned a significantly higher posttest mean score. The posttest mean score showed a gain of 9.79 points. The mean score increased from 72.32 on the pretest to 82.11 on the posttest. The difference between the two means is significant at the .05 level, $t(19)=3.224$, $p<.05$ (two tailed). (Refer to Table 14)

Summary

The purpose of this project was to determine the effects of aligning Bloom's Taxonomy with the *Virginia English SOL* Framework for Fourth Grade. Based on disaggregated data results from Microsoft Excel, ROS and SPSS[®], two groups of student reading test scores were analyzed. The analysis determined the following:

- The main effect of group was not significant.
- Null Hypothesis 1 was retained.

- Null Hypothesis 2 was rejected.
- The Experimental Group, performed lower on the pretest than the Control Group.
- Both groups made gains on the posttest. The Experimental Group made greater gains when comparing adjusted means than the Control Group.
- The passing rate for the Experimental Group increased by 58 percent. The passing rate for the Control Group increased by 33 percent.
- The number of students earning passing scores increased for each group. The Experimental Group's posttest scores increased by 60 percent, while the Control Group's scores increased by 27 percent.

A discussion of the results is presented in Chapter Five.

Chapter Five: Summary & Discussion

The *No Child Left Behind (NCLB)* legislation, impacted by riveting reports such as “A Nation at Risk: The Imperative for Educational Reform” released in 1983, ushered in a new generation of accountability for all educators. It required the implementation of statewide assessments in reading and mathematics for grades three through eight, as well as assessments at the end of some courses at the secondary level. The objective of the law was to ensure that all groups of students were making sufficient progress each year, known as Adequate Yearly Progress (AYP). Silver, Strong, Perini, and Tuculescu (2004) described the new generation as the third generation of accountability whose responsibility is to “make the students as important as the standards”. The progress must represent academic growth in subgroups of students which include “all students, racial/ethnic groups, economically disadvantaged students, students with disabilities, and students with limited English proficiency” (United States Department of Education, 2003). As a result, most states have developed rigorous standards for each grade level which articulate what is to be taught. These standards are often considered the minimum content classroom instruction should include. Student results on high stakes tests in reading and mathematics serve as the foundation for determining the progress in meeting those rigorous standards. In addition to the reading and mathematics assessments, state accreditation of schools in Virginia requires assessments in science and social studies.

Educators are now faced with preparing students to work and live in a world-wide environment as opposed to the more national environment that existed two decades ago.

High-speed Internet access is becoming available not only in rural areas, but to developing countries, thereby providing instant access to massive amounts of information and data. Due to these advancements, information and knowledge are no longer considered entities to be attained, but tools used to complete activities in living, learning, and working environments. Students are required to know how to access, evaluate, and then apply the information to meet their needs; all of which require higher order thinking skills.

Evidence presented in the literature supports the belief that students who engage in higher order thinking skills are better equipped to think and perform more effectively on standardized tests (Carneson, Delpierre, & Masters, n.d.; Tankersley, 2005). However, no research was available which examined the relationship between engaging students in higher order thinking skills and the outcomes on benchmark tests. Therefore, this research project was designed to examine the effects on student achievement by using Bloom's Taxonomy to align fourth grade reading instruction with the *Virginia SOL* Fourth Grade English Framework.

This chapter summarizes the research problem, the project's purpose, and the methodology used to complete the project. Also presented in this chapter is an analysis of the results with applications for educators. The chapter concludes with a discussion on the limitations of the study and recommendations for further research.

The Research Problem

Each school year begins with higher expectations for students and teachers. Required passing rates for national and state mandated assessments also increase with the beginning of each school year. The AYP reading passing rate, determined by *NCLB* requirements, set for the 2009-2010 school year is 85 percent. Over the next two years,

the targets rise to 89 and 93 percent (Virginia Department of Education: Accountability Guide, 2010). According to the state report card for Virginia, during the 2008-2009 school year students in the Commonwealth earned a passing rate of 87 percent on *SOL* assessments. The results from these assessments determine the AYP for Virginia's public schools (Virginia School Report Card, n.d.). Requirements for accreditation from the Commonwealth of Virginia set the reading passing rates for students in grades three through five at 75 percent. While students may obtain scores that establish state accreditation for the school division, there must be continuous improvement on *SOL* tests to meet AYP requirements.

A hasty conclusion could be drawn that if teachers and students continued using the strategies and methods they are currently implementing, AYP requirements would be met. This assumption would be a mistake, as AYP requirements continue to increase. Furthermore, revised *SOL* assessments are more analytical than previous assessments. Earlier assessments were more skill driven, and required students to use more specific reading skills. In essence, students could be taught the how and when to use a skill with the anticipation of using those skills to be able to pass the *SOL* tests.

Current *SOL* reading tests contain two areas or strands: word analysis and comprehension. Reading Test Blueprints for the third and fourth grades stipulate that 19 percent of the test must consist of word analysis skills, and 64 percent of the test must include comprehension skills. At the fifth grade level, the test must include word analysis skills equivalent to 20 percent of the test and comprehension skills equal to 60 percent of the test. In each case, the remainder of the tests consists of field test questions. Based on the dynamics of the test construction, a student must be successful on the comprehension portion of the test. Therefore, students must improve comprehension

skills if the goals for state and national accreditation are to be met. Consequently, students need more opportunities during reading class to build and apply a repertoire of higher-order thinking skills.

Statement of Purpose

This project examined the effects on student achievement as a result of aligning Bloom's Taxonomy to the *SOL* English Framework for Fourth Grade. Bloom's Taxonomy, an established framework for organizing higher-order thinking, provided a scaffold for planning reading instruction to increase the student use of higher order thinking skills.

SOL testing at fourth grade is still in its infancy, which led to the selection of fourth grade students for participation in this project. The 2008-2009 school year was the fourth year for testing reading in the fourth grade. In comparison, third and fifth grade students began participating in the assessment program in 1998.

This study sought to determine the effect of having a teacher purposely develop lessons and assessments aligning the *SOL* English Framework for Fourth Grade to Bloom's Taxonomy on the Reading Benchmark Assessment scores of fourth grade students. Two null hypotheses were explored by this study.

Null Hypothesis 1: There will be no significant difference in the means of the third nine weeks Reading Benchmark Assessment for Grade Four posttest scores for the Experimental Group in which the teacher developed lessons using Bloom's Taxonomy than the means of the Control Group which uses traditional textbook bound instruction.

Null Hypothesis 2: There will be no significant difference in the mean scores of the Experimental Group in which the teacher developed lessons using Bloom's

Taxonomy as measured by the difference between the pretest and the posttest scores on the third nine weeks Reading Benchmark Assessment for Grade Four.

Review of Methodology

During a nine week period beginning in January 2008 and ending in March 2008, this study was conducted with a group of fourth grade students in a rural, K-5 public school. A nonrandomized control group, pretest posttest design was utilized. The assessment used was the fourth grade third nine weeks Benchmark Assessment for Reading developed by the Division in conjunction with Tests for Higher Standards. The instrument contained 34 multiple choice questions. A total of three selections from the genres of fiction, nonfiction, and poetry were included on the assessment which had a readability range of 3.9 to 7.0. This assessment was chosen because it is used by the local division to guide instructional decisions in addition to predicting student success on the *SOL* English tests.

Two reading teachers, each with more than ten years of experience, participated in the study. The teacher for the Experimental Group received additional training on unpacking the *SOL* Framework, applying Bloom's Taxonomy, and developing lessons that incorporated higher order thinking skills. There was one full day of training and eight after-school sessions. In addition, the researcher was able to conduct a total of four classroom walk-throughs throughout the project. The teacher of the Control Group did not receive any additional training.

Both treatment groups were administered the pretest on the second day of the second semester. The posttest was administered on the forty-third day of the nine weeks. The researcher distributed and collected the pretests and posttests in sealed envelopes

which were not opened until they were scanned. A total of 39 responses were used to complete this study.

Results from the assessment were analyzed using Microsoft Excel, Reports Online System (ROS), and SPSS[®]. An alpha coefficient of 0.05 was used to conduct an ANCOVA for determining the effect of group and pretest on the posttest results. The ANCOVA determined there were no significant interactions that would have affected the posttest results, therefore, the results were considered valid.

Summary of Results

One of the goals of this research project was to determine the effects of aligning the *SOL* English Framework with Bloom's taxonomy on student achievement. Two null hypotheses guided this project. The results will be discussed in terms of the correlating hypothesis.

Null Hypothesis 1: There will be no significant difference in the means of the third nine weeks Reading Benchmark Assessment for Grade Four posttest scores for the Experimental Group in which the teacher developed lessons using Bloom's Taxonomy than the means of the Control Group which uses traditional textbook bound instruction.

The teacher of the Experimental Group developed lessons by aligning Bloom's Taxonomy to the required content in the *SOL* Framework for fourth grade reading. This study concentrated only on the reading *SOL*, and did not include those related to oral language and writing. The Control Group participated in lessons developed based on a more traditional method of using the textbook while incorporating the reading *SOL*.

Analysis of the disaggregated data, including ANCOVA results, determined Null Hypothesis 1 must be retained. The Experimental Group had a mean posttest score of 82.11 and the Control Group had a mean posttest score of 83.40. The ANCOVA results,

which used an alpha level of 0.05, disclosed there was no significant difference in the scores. Therefore, these findings suggest that in general there was no statistical difference between the posttest scores of the two groups.

Null Hypothesis 2: There will be no significant difference in the mean scores of the Experimental Group in which the teacher developed lessons using Bloom's Taxonomy as measured by the difference between the pretest and the posttest scores on the third nine weeks Reading Benchmark Assessment for Grade Four.

Based on the disaggregated data, which included a dependent samples *t-Test*, Null Hypothesis 2 was rejected. Null Hypothesis 2 specifically explored the difference in the pretest and posttest scores of the Experimental Group. The results of this study indicated that the scores did increase. Results from the *t*-test confirmed a significant gain between the pretest and posttest scores, $t(18)=3.224$, $p<.05$. Data also revealed that the median posttest scores of the Experimental Group increased by eleven points when compared to the same group's pretest scores. In terms of student success, the pretest passing rate for the Experimental Group was 53 percent. The posttest passing rate for this group increased by 60 percent. Six additional students earned a passing score. Based on these results, this project determined that aligning Bloom's Taxonomy with the *SOL* English Framework had a positive effect on student scores when comparing the same students' pretest and posttest scores.

Discussion of Results

The results of this quantitative research study revealed several insights which have the potential to positively impact student achievement, which in most cases is determined by student results on high stakes tests. While current trends in American education require teachers to use a myriad of teaching strategies and students to use tools

that were nonexistent two decades ago, success in education is chiefly determined by the data (Boss, 2009; Oates, 2009; Marzano, 2010). The rephrasing of an old adage is “the proof is in the numbers.” Therefore, the results of this study illustrate specific benefits of aligning Bloom’s Taxonomy to the *SOL* Reading Framework. The insights and benefits revealed are discussed in this section.

Evidence suggests that a positive relationship exists between student achievement and instruction that is taught at the higher levels of Bloom’s Taxonomy. As mentioned in the literature review, Raths (2002) and Tankersley (2005) discussed the improved instruction and positive impact on student learning when the complexity of the lesson objectives increased over lessons or units. The findings of this study are in agreement with Raths and Tankersley. The Experimental Group’s passing rate increased by 58 percent on the Division’s Benchmark Assessment. These results confirm the relationship between student achievement and instruction taught at higher levels of Bloom’s Taxonomy. However, the true significance of these results is not manifested until the results are utilized to help other students. Therefore, it is necessary to determine which factors contributed to this gain and disclose them in a manner that is feasible for classroom implementation.

Interpreting Data.

Often test results are disseminated to the community through newspaper articles and reports sent home to parents. Once the reports are received, teachers, administrators, parents, and even community members are expected to not only read the reports, but interpret the information. There are times when a cursory look at data can lead to misinterpretation. Interpreting students’ results is a multi-faceted process that includes examining what Hitch and Jenkins (n.d.) refer to as “hard numbers” and “soft measures”.

Hard numbers describe the data being analyzed, while the soft measures express entities such as time, morale, emotional investment, and disengagement. All stakeholders should not be presented with the entire compilation of hard numbers and the soft measures. However, it is imperative that those using the data from high stakes assessments as supports for instructional and financial decisions are made aware of a complete picture of the results. Otherwise misinterpretations of the data can easily lead to poor decisions and inaccurate reporting. This view is supported by the research analysis of Marsh, et al. (2006), who determined that data must be understood in the larger context to avoid invalid inferences.

In this case, the results from the benchmark tests represent the hard numbers, and the soft measures are represented by valuable information gleaned from the teacher that could impact the results as well as go unnoticed.

The hard numbers from this study established several facts:

1. There is no significant difference between the Experimental Group's posttest scores and the Control Group's posttest scores.
2. There is a significant difference between the Experimental Group's pretest and posttest scores.
3. There are no extreme values in the Control Group's posttest scores.
4. Student A in the Experimental Group earned a pretest score of 50. While this represents the lowest score, a total of two students received the same score.

However, the posttest score of Student A dropped to 29. The score of 29 was reported as an extreme value when the descriptive statics were analyzed in SPSS®.

5. The exclusion of the extreme value (score = 29), provides a more realistic view of the posttest results. The mean score for the group increased by 2.95 points; the median increased by 1.5 points; and, the range decreased by 30 points. Table 16 shows the statistics with and without the extreme posttest value.

Table 16.

Descriptive Statistics for the Experimental Group Excluding the Extreme Score

Variable	n	M	Mdn	Range
Posttest including extreme score	19	82.11	85.00	71
Posttest excluding extreme score	18	85.05	86.50	41

Critical Passing Point and Critical Passing Range.

This researcher has found through experience that there is a critical passing point (CPP) and a critical passing range for every assessment. When students earn a passing score on an assessment the score is often accepted at face value. The same is true when a student fails an assessment by a small margin. Analyzing both scores using the critical passing point and critical passing range can determine the strength of the score. Could the student who failed the assessment have passed by answering one more question correctly? Would the student who passed the test have earned a passing score if one less question had been answered correctly? Using the CPP helps answer these questions by identifying students who may be having difficulty understanding the pedagogical style of the classroom teacher. The data provided from the CPP also may reveal students who would be in danger of “slipping through the cracks.” These data can aid in child study meetings or be applied to Response to Intervention (RTI) strategies. This point is derived by determining the number of correctly answered items needed to earn a passing score, and the value of that point. This is denoted in the study as CPP:??=??.

The critical passing range is the range of scores that are in a band of five points below and above the CPP. A range is denoted in this study following the CPP in parentheses, CPP:??=??,(??-??). The number to the left of the comma in the parentheses is the score at the lower end of the range, and the number to right of the comma is the score at the upper end of the range. When reporting student data, the information is represented by denoting the number of student scores below, equal to, and above the CPP. This information is vital when interpreting scores as it provides hard numbers representing the number of students who are close to passing an assessment or who may have passed based on one or two “lucky” guesses. Table 17 shows the Critical Passing Point and Critical Passing Range for the posttest scores from this study, applying the Division’s passing score of 70.

Table 17.

Posttest Scores Analyzed by the Critical Passing Point and Critical Passing Range

	N	n ^a	Below	Equal	Above
Experimental Group	19	2	0	1	1
Control Group	20	7	0	2	5

^aCPP: 24=71, (66-77)

Further analysis of the CPP reveals that one student in the Experimental Group earned the passing score by answering 24 questions, the minimum required to pass the test. Another student in the same group passed the test by answering one question more than the minimum required to pass the test. The initial descriptive statistics from this study would conclude that the Control Group’s progress is satisfactory. However, using the information derived from the CPP, two students earned the minimum score to pass, and five of the scores were considered passing because one or two additional questions were answered correctly. Using the CPP will allow teachers to explore and examine

student results for instructional implications, thus addressing student weaknesses in a more systematic and prolific way. Moreover, the use of the CPP will help provide evidence for both effective and ineffective classroom instruction.

Evidence presented in the literature supports the strong connection obtained from aligning the curriculum, instruction, and assessment (Mitchell, 1999; Raths, 2002; The Benefits, 2004). Using the CPP in conjunction with other data helps educators determine if there is a need to reexamine the alignment of the three components: curriculum, instruction, and assessment, or to only study one component. Based on the data from this study, a conclusion can be made that the curriculum, instruction, and assessment are tightly aligned because the CPP scores from both groups were above the passing score. Also, an item analysis of the test results within the critical passing range may aid in determining the students' specific areas of weakness. In cases where the scores of the students are not in the critical passing range, it would be advantageous for the teachers or administrators to revisit instructional supports as the curriculum guide, strategies used for delivering particular content, and test formatting.

One soft measure from this study provided additional insight to the results of the Experimental Group. Examining the hard numbers revealed that Student A had an extreme score. Further investigation revealed that during the time of the study, this student had been suspended due to conduct problems stemming from a new change in the home. While knowing this information does not change the posttest results, it does help provide perspective to the success of the project.

Contributing Factors.

One factor contributing to the increase in student achievement was the use of higher order thinking skills on a consistent basis. The reading instruction received by the

Experimental Group focused on spiraling reading skills from the lower levels of the taxonomy to the upper levels of the taxonomy. Students must be able to process the information at the lower levels of Bloom's Taxonomy before they can apply a skill at the higher level. As presented in the literature review, Bloom surmised that before students could be taught at the higher levels of the taxonomy, teachers must be able to think and teach at those levels.

Skill spiraling occurred for each reading lesson. Skills were mapped to ensure that each skill was taught and/or reviewed at each level of Bloom's Taxonomy. One of the first activities for the teacher was to develop questions for each selection based on the Bloom's Questioning Sheet developed for the project. Through the use of this format, the teacher determined at which point in the lesson each level of question would be most effective. This was one example of providing students with consistent opportunities to apply higher order thinking skills. The results of the students in the Experimental Group, supported Tankersley's beliefs that students can only do well on high-stakes tests when they know how to think, which occurs in reading when students can synthesize, analyze, evaluate, and interpret information (Tankersley, 2005).

A second factor contributing to the increase in student achievement was the application of higher order thinking skills to different genres. Once a week, the Experimental Group participated in reading lessons in which they were required to evaluate the author's purpose. This discussion was conducted for each selection from the reading anthology regardless of genre. Students evaluated four realistic fiction selections and one nonfiction selection as guided practice. While working in flexible groups, students were provided with leveled readers as well as nonfiction articles and poems.

The students were assigned the task of evaluating and discussing the author's purpose for the given selection applying the same process used during the guided practice.

Based on the research of Bloom and Broder, which involved students of low- and high-aptitudes, Whimbey (1984) discussed importance of teaching students to change their thinking from what he calls "one shot" thinking to precise processing which enables students to transfer skills and strategies to other content or situations they may encounter. His discussion supports the strategy applied in this study. As a result, the conclusion can be drawn that the students in the Experimental Group were able to transfer the skills practiced during guided practice to the various forms of genre they encountered at other times. This may help account for the fact that the Experimental Group's mean posttest scores were 9.79 points higher than their pretest scores.

The results of this investigation also affirmed that the use of lesson plans was an effective tool for aligning Bloom's Taxonomy to the *SOL* Framework. Kizlik (2008a) stated that the purpose of a lesson plan is to serve as a guide for teachers as they help students attain desired outcomes from the lesson. Often unexpected schedule changes occur that disrupt a planned lesson, which means there are times when a teacher will not explicitly follow the prepared lesson plan. Planning does not guarantee implementation. However, because the teacher integrates the thought processes of preparing for the lesson aligned with Bloom's Taxonomy, there is a greater possibility that the teaching strategies and activities planned incorporating higher order thinking will be employed.

The teacher of the Experimental Group used a lesson plan format that mandated the inclusion of certain components. One of those components specified the level of Bloom's Taxonomy incorporated into the lesson, and the lesson objectives were written to include verbs from the taxonomy. As noted by Wong, using verbs from each level of

the taxonomy will advance students to higher levels of thinking (Wong, 2005). By requiring the teacher to specify the level of Bloom's Taxonomy addressed in the lesson, and to write objectives using verbs from the Taxonomy, she was compelled to constantly analyze the cognitive level instruction planned for her students. A pattern of instruction emerged. Most lessons taught at the knowledge and comprehension levels introduced the selection to the children or allowed them to manipulate the information in preparation for future lessons. For example, after introducing the vocabulary words, students were asked to illustrate them and then explain their illustration. Another activity used the vocabulary words in cloze passages. Later, the students were expected to participate in group discussions about the selection using the vocabulary words fluently and accurately. As the project progressed, the teacher began to intuitively analyze the objectives based on the verbs used, and quickly recognized a lesson that contained mostly lower level skills. As a result, the lesson plans used in this project by the teacher of the Experimental Group became a handbook for developing higher order thinking skills correlated to the *SOL* Framework for the fourth grade.

Also, a confirmation for teacher self-reflection occurred. The importance of self-reflection is well documented. As early as 1933, Dewey suggested that learning comes from reflecting on dilemmas or experiences, not just the experience (Danielson, 2009; "The Role of Critical Reflection", n.d.; Stevens & Richards, 1992). Tripp (as cited in Hole and McEntee) promotes the practice of teachers thinking about the events and lessons that occur during the day because it is through those experiences teachers can learn about the "the trends, motives, and structure of our practice" (Hole and McEntee, 1999). A more extensive statement on reflection was made by Schön (as cited in

Atherton) who suggested that one characteristic of professional practice is the ability to reflect on one's actions as a part of a continuous learning process (Atherton, 2009).

During the course of the project, the teacher of the Experimental Group reflected on previous lessons and lesson plans to ensure a spiraling of skills was occurring. She was a veteran teacher who was accustomed to reflecting on student actions and humorous or serious events that had occurred in her class. She was adept at analyzing and developing accurate judgments concerning those situations. The aspect of reflection that was different for this teacher was the analysis, synthesis, and evaluation of the student outcomes of her lessons in relation to the lesson she had planned. In essence, the teacher was required to think about and process lesson planning at a higher level. This practice was in direct opposition of how Nerbovig and Klausmeier (1962) described many teachers' traditional lesson plans - a detailed schedule of daily activities. The outcome of this project also supported Burke's (2002) comments on the results of effective lesson plans. He concluded that lesson plans should promote greater student success, higher student test scores, improved retention, and a better attitude towards school. The process of reflection based on student outcomes encouraged the development of improved lesson plans. By the end of this project, the teacher's conversations were balanced between precise, critical comments about her pedagogy and antidotes from her classroom.

Aligning Bloom's Taxonomy to the *SOL* Framework prepared students for local and state high stakes assessments. The *SOL* Framework continues to serve as guidance for Virginia educators to the *SOL*. These standards are intended to be the foundation for school divisions to use when making curricular, instructional, and assessment plans.

The specific benchmark assessment used by the Division was developed based on the format of the *SOL* assessments given by the state. Since local and state assessments

are based on the *SOL*, when instruction is based on the skills in the *SOL* Framework, students are learning specific skills that will be included on state assessments. The *SOL* tests are becoming more analytical with each revision cycle. Using higher order thinking skills such as those found at the upper end of Bloom's Taxonomy, provides examples for students to analyze formatted similar to those they will experience on both assessments.

Unexpected Results

Division Buy-in.

While the research yielded some expected results, several unexpected results emerged. Three of the unexpected results are discussed. They are division, teacher, and student buy-in.

At the onset of this project, several meetings and conversations were held with central office administrators. During those meetings the importance of Bloom's Taxonomy and the use of higher order thinking skills were discussed. Central office administrators expressed support for the project as well as well as much interest in the potential effects of proposed teaching strategies on student achievement.

During the school year in which the project was implemented non-participating teachers were encouraged to include higher order thinking skills in their lessons. No formal instructions were provided for the teachers, nor were any mandates issued from central office or the school. Yet, a diminutive effect on this study may have occurred. However, an examination of the lesson plans submitted by the teacher of the Control Group did not show any overt effort to include higher order thinking skills in any lessons.

Teacher Buy-in.

The teacher of the Experimental Group began the study apprehensively. She expressed concern about using a different lesson plan format instead of the format she

had used for several years. She also expressed discomfort about the amount of time it took to complete the new lesson plans required for the project. During the after-school sessions, the teacher shared that the length of time required to complete the lesson plans continued to be a source of tension. When the project was over, the teacher did reveal that as time passed, the issue was not as stressful as it had been. One of the final comments made by the teacher was that the effects of using the different lesson plan format and the extra time did make a difference in student achievement. The change in attitude of the teacher mirrors the results Sparapani (1999) found in her study on teacher reactions to teaching at higher levels of thinking. She noted that the teachers acknowledged that it took more time to develop lessons promoting higher levels of thinking. In addition, the teachers expressed the need to be more select when deciding which activities would be included in the lesson to ensure activities were meaningful for the students.

Another concern expressed by the teacher was the amount of work involved in participating in the study. She did have to develop some new materials as opposed to using those she had created in previous years. During the after-school sessions the teacher shared her thoughts. Below are some of her comments.

- “I am still concerned about the amount of time it is taking me to prepare for my reading lessons.”
- “The students especially enjoyed the making connections part of the lesson.”
- “I have had a decrease in behavior problems during reading class. Students that usually get in trouble for talking are now excelling because they can participate in constructive talk about the story and themselves at the same time.”

- “I enjoy teaching reading using these strategies. It keeps me motivated and challenged. My students asked to do reading.”

An additional unexpected result occurred the following school year. The teacher of the Experimental Group’s grade assignment changed. Despite working with younger students, she continued to teach reading using the strategies she learned and implemented through participation in the project. She shared her beliefs that the outstanding scores her students received on the Division’s benchmark assessments were due to the use of the strategies. It was confirmed that her class the following year had an average passing rate of 95 percent.

Student Buy-in.

This project began with the second semester of the school year. Therefore, the teacher and the students already had established a classroom routine. Some of the strategies and expectations used in the project were different than those used during the previous semester.

Making connections to the literature was one strategy implemented. The teacher reported that the students enjoyed using the sticky notes to denote their connections in the text. When required to explain the rationale for their connections, the students found the task hard to complete at the beginning of the project. However, after gaining more experience in this type of participation, they enjoyed the activity and transferred it to other subjects. She also noted fewer behavior problems occurred relating to talking during reading, when the students had the chance to constructively communicate with each other. The activity served as an impetus for motivating student participation. This student reaction supports the tenets of both behaviorism and cognitivism. As the students learned to have meaningful discussions during class, they received positive reinforcement

by being able to talk freely in class. The more success the students experienced, the more they participated in class. They also exhibited greater self-confidence which was evident by the students taking greater risks during class discussions and participating in class at higher cognitive levels.

Applications of Results

Educational research has several goals. Three of the goals of an educational research project are to contribute to the solving of problems in education, contribute to the educational body of knowledge, and to base these contributions on a systematic process of data collection. This project fulfills those goals since it suggests a possible solution to helping fourth grade students increase their success on standardized tests in reading. Furthermore, the project contributes data to the limited body of research available pertaining to fourth grade students in Virginia, Bloom's Taxonomy, and the *SOL* Framework as an entity. Another reason this project fulfills the preceding goals is due to the process used to generate, gather, and analyze the data. Established research practices and policies were followed resulting in reliable, valid data. The results of this study suggest applications that can positively impact instructional, curricular, and assessment decisions, in addition to lesson plans at all levels. In many cases, the implementation of the recommended applications can occur with limited resources. Two of those applications are the incorporation of active thinking during the course of planning lessons and implementing instruction, and the staff development model incorporated in the project.

Division administrators can use the results of this study as a strategy for schools not meeting the requirements of AYP or those in school improvement status. This project has demonstrated one way specific strategies for spiraling the levels of Bloom's

Taxonomy could be implemented, and with minor modifications could be replicated school-wide. The use of the critical passing point (CPP) can help in determining if reexamination of the alignment between curriculum, instruction, and assessment is needed.

The Division supported this project by granting the teacher involved the freedom to deviate from traditional lesson plans, the curriculum guide, and the pacing guide. It is acknowledged that deviating from those items in an unstructured fashion may not be practical for implementation on a Division-wide basis. However, given the amount of scrutiny educators face, the project provides another strategy to aid in developing a structured, well-planned implementation process for increasing the use of higher order thinking skills in conjunction with the *SOL* Reading Framework.

In addition, this project provides an example of continuous professional development to aid teachers in improving their instruction and student achievement by putting more emphasis on higher-order thinking skills in their daily lessons. This concept corroborates the ideas that empowering teachers to use critical thinking skills in their lessons must be supported by professional development. Training should begin with pre-service teachers. The needs of existing classroom teachers should be addressed by a long-term commitment at the Division level for supporting programs and strategies that promote the critical thinking process (*Critical Thinking Skills, 1988*).

Building administrators might use this study as a source for implementing school-wide research based strategies. The strategies used in this research study were applicable to the K-5 elementary setting. For example, flexible reading groups are being utilized in many schools as a standard instructional delivery method. Materials such as leveled readers and additional selections are a part of most reading series. Using pre-existing

materials in a different manner may result in greater achievement gains, with a minimal investment. In addition, principals may want to replicate a simplified form of this study as action research with selected grade levels and personnel.

Teachers can use the results of this study as a springboard to differentiating instruction by using higher order thinking skills as an instructional component. The data presented through research may increase teacher understanding of the effect of using Bloom's Taxonomy when planning instructional activities. Teachers can then determine additional strategies that will increase student use of higher order thinking skills. The use of the critical passing point can help teachers determine areas in which they need to modify instruction. The strategies implemented in the study can also help teachers in determining students that need various levels of remediation. In some cases, students who earned a failing score only may need encouragement and a demonstration of compassion.

Another application of this project is continued professional development. Many teachers remember Bloom's Taxonomy from courses taken while pursuing their undergraduate degree. Yet many of them fail to use higher order thinking skills themselves or understand how to apply the taxonomy to instruction. The National Staff Development Council suggested that at least 35 hours of effective professional development are required before instructional changes are manifested (Washburn, 2006). After-school sessions such as the ones implemented in this project would enable teachers to execute strategies and then convene on a regular basis to discuss the outcomes, learning from one another. As this occurs across grades levels and subjects, the entire school's academic structure would be strengthened. This type of collaboration would also create tighter vertical and horizontal alignment of skills.

Limitations of the Study

The results of this study were based on a limited population. Due to the population size, it was not viable to eliminate outliers from the data. A larger population would have allowed for the removal of outliers from the disaggregated data.

The participants were from one school, at one grade level. This study also was limited to one subject area. Results may differ in another subject area. An additional limitation to be considered is the impact of the Division's heightened encouragement for the use of Bloom's Taxonomy. Therefore, consideration should be given when generalizing these results.

Implications from the Study

This research project examined the effects of aligning Bloom's Taxonomy to the *Virginia SOL* Framework for Reading. The process used in the project compelled the teacher involved to develop a new paradigm concerning planning for teaching reading in a fourth grade classroom. The model used in the project required the teacher to consider the purpose for each component of the lesson. In addition, the teacher was required to categorize each activity conducted by the teacher and the students based on a level of Bloom's Taxonomy. This process of planning transcends content and can be applied to planning any lesson regardless of the standard used. (See Appendix C)

At the conclusion of the project, conversations with the teacher revealed that the desired paradigm change had occurred within the teacher. One outcome was that the veteran teacher changed her instructional strategies through participation in the project. Therefore this project could be considered positive evidence to support the concept of school reform through continuous improvement and supported professional development.

Another result of the study was that the students in the Experimental Group cultivated a new set of expectations. The students' enhanced expectations included having:

- opportunities to share their answers as well as the rationales behind their responses;
- opportunities to freely exchange and converse about the subject matter; and
- opportunities to continue using the new strategies they learned.

The students also began to take responsibility for their learning. Therefore, this project was a success since it holds implications for improving active thinking in students.

According to Bonwell and Eison (1991), active thinking includes using higher order thinking skills such as analysis, synthesis, and evaluation. Furthermore, Bonwell and Eison propose a definition for active learning as instructional activities requiring students to “do things and think about what they are doing.” Based on their proposed definition, the teacher of this project also became an active thinker as she completed the planning process. Due to the mandated lesson plan format for the project, the teacher had to think of her specific role in activities and its relevance to the lesson. In essence, the teacher was required to think about what she was doing. As standards change, the concept of active thinking will continue to be applicable for teachers since it influences the planning process and the learning process for the students.

The results of the research established the benefits of aligning Bloom's Taxonomy to the *Virginia SOL* Reading Framework, and it provided a documentation platform for addressing the varying needs of students at all levels. Therefore, the project met the second of the intended goals designated in Chapter One. Most importantly, this

project has the potential to impact both teachers and students. As novice and veteran teachers strive to prepare diverse groups of students to meet the demands of increasing expectations from stakeholders, the results of this project emphasized strategies that will help teachers work smarter and more effectively, rather than harder. The results also call attention to positive outcomes derived from developing higher order thinking skills. These skills are essential to empower students for participation in the increasingly globalizing world of higher education and the workforce.

Recommendations for Future Research

Additional research in this area could prove beneficial. Further research ideas conclude this discussion.

1. Replication of the study could be conducted with the teacher of the Experimental Group to determine the effect experience in teaching the strategies has on student achievement as well as teacher enthusiasm.
2. Replication of the study in school divisions with similar demographics may validate this study thereby escalating the use of higher order thinking skills in reading classes.
3. A replication of this study with a larger population may reveal additional strategies for improving student achievement after removal of any outliers.
4. Further research in urban areas or private schools may reveal additional data regarding the effect of strategies used on student achievement.
5. Conducting additional research with older students may provide insights to student reactions to using higher order thinking skills regularly. It would be of interest to note their academic and behavioral reactions of this age group as well as their subjective reactions to the strategies.

6. Research in the area of student behavior related to the cognitive level of instruction may provide significant findings for teachers of students with behavioral problems.
7. A replication of this study including the subgroup demographic information of the participants required for AYP would provide data to determine the impact on the subgroups.
8. Longitudinal research could determine if the results are valid over a more extended period of time.

References

- Afflerbach, P. (2007). *Understanding and using reading assessment*. Newark: International Reading Association.
- Alabama Department of Education. (2003). *Aligning curriculum, instruction, classroom assessments, and standardized tests*. Retrieved from http://web.utk.edu/~mccay/apdm/align/align_b.htm
- Analysis of the Department of Education's Budget Impact on Rural America*. (n.d.) Retrieved February 3, 2009 from <http://www.cfra.org/files/Why%20Rural%20Matters%202007%20Budget%20Analysis.pdf>
- Appropriate use of high-stakes testing in our nations schools*. (2001). Retrieved September 2, 2008 from American Psychological Association website: <http://www.apa.org/pubs/info/brochures/testing.aspx>
- Armbruster, B., Lehr, F., & Osborn, J. (2003). *Put reading first: The research building blocks for teaching children to read*. Jessup, MD: National Institute for Literacy @ ED pubs.
- ASCD: A Lexicon of Learning. (2009 a). Retrieved December 3, 2009, from http://www.ascd.org/Publications/Lexicon_of_Learning/A.aspx
- ASCD: A Lexicon of Learning. (2009b). Retrieved December 3, 2009, from http://www.ascd.org/Publications/Lexicon_of_Learning/B.aspx
- ASCD: A Lexicon of Learning. (2009d). Retrieved December 3, 2009, from http://www.ascd.org/Publications/Lexicon_of_Learning/D.aspx
- ASCD: A Lexicon of Learning. (2009e). Retrieved December 3, 2009, from http://www.ascd.org/Publications/Lexicon_of_Learning/H.aspx

ASCD: A Lexicon of Learning. (2009f). Retrieved December 3, 2009, from

http://www.ascd.org/Publications/Lexicon_of_Learning/P.aspx

Atherton, J.S. (2009) *Learning and Teaching; Reflection and Reflective Practice*.

Retrieved January 22, 2010, from :

<http://www.learningandteaching.info/learning/reflecti.htm>

Barth, P. & Mitchell, R. (2006). *Research q & a: standardized tests and their impact on schooling*. Retrieved September 2, 2008 from Center for Public Education website:

http://www.centerforpubliceducation.org/site/c.lvIXIiN0JwE/b.5057083/k.A65E/Research_Q_A_Standardized_tests_and_their_impact_on_schooling.htm

Behavioral Theories. (n.d.). Retrieved November 14, 2009, from

<http://viking.coe.uh.edu/~ichen/ebook/et-it/behavior.htm>

Bloom, B., & Krathwohl, D. (1956). *Taxonomy of educational objectives: The classification of educational goals, by a committee of college and university examiners. Handbook I: Cognitive domain*. New York, NY: Longmans, Green.

Bloom's Taxonomy Action Verbs. (n.d.). Retrieved April 22, 2009, from

http://www.clemson.edu/assessment/assessmentpractices/referencematerials/documents/Blooms_Taxonomy_Action_Verbs.pdf

Bonwell, C., & Eison, J. (1991). *Active learning: creating excitement in the classroom*.

ERIC Digest. Retrieved from ERIC database. (ED340272).

Boston, C. (2003). *Cognitive science and assessment*. *ERIC Digest*. Retrieved from ERIC database. (ED481716).

- Boss, S. (2009). Managing messy learning. *Educational Leadership*. 67(1). Retrieved from
from
http://www.ascd.org/publications/educational_leadership/sept09/vol67/num01/toc.aspx
- Brady, M. (2008). Cover the Material – Or Teach Students to Think? *Educational Leadership*. 65(5), p.64-67. Retrieved from
http://www.ascd.org/publications/educational_leadership/feb08/vol65/num05/toc.aspx
- Brailey, L. & Ashley, S. (2007). *Collaboration and collaborative teaming*. [PowerPoint Slides]. Virginia Commonwealth University Training /Technical Assistance Center workshop. Richmond, VA.
- Brissenden, G., & Slater, T. (n.d.) *Assessment within the content of course development*. Retrieved January 1, 2008, from
<http://www.wcer.wisc.edu/archive/C11/flag/start/primer3.htm>
- Brualdi, A. (1998, August). *Implementing performance assessment in the classroom*. Retrieved September 2, 2008, from The Catholic University of America Department of Education website: <http://ericae.net/digests/tm9807.htm>
- Burke, L. (2002). *The teacher's ultimate planning guide* (p. 116). Thousand Oaks, CA: Corwin Press, Inc.
- Carneson, J., Delpierre, G., & Masters, K. (n.d.) *Designing and managing mcqs: Appendix c: Mcq and Bloom's taxonomy*. Retrieved January 1, 2008, from
<http://web.uct.ac.za/projects/cbe/mcqman/mcqappc.html>

- Carr, K.S. (1990). *How can we teach critical thinking?* ERIC Clearinghouse on Elementary and Early Childhood Education. Retrieved from ERIC database. (ED326304)
- Chappius, S. (2007). Sound assessment through policy: aligning teacher and school practices to support the division's missions and goals. *The School Administrator*, 64. Retrieved August 17, 2008, from <http://www.aasa.org/publications/saarticledetail.cfm?ItemNumber=7942>
- Cho, J. (2009, Spring). Evolving Connections. [Editorial]. *Making Connections: Linking Talented Educators*, p2.
- Clarke, M., Haney, W., & Madaus, G. (2000). High stakes testing and high school completion. Retrieved September 2, 2008 from <http://www.bc.edu/research/nbetpp/publications/v1n3.html>
- Clarke, M., Madaus, G., Horn, C., & Ramos, M. (2000). Retrospect on educational testing and assessment in the 20th century. *Journal of Curriculum*, 32(2). Retrieved September 2, 2008, from <http://www.tandf.co.uk/journals/tf/00220272.html>
- Classroom organization: the physical environment*. Retrieved December 9, 2009, from Scholastic website: <http://www2.scholastic.com/browse/article.jsp?id=4134>
- Claudet, J.G. (1999). An interpretive analysis of educator change processes in response to a program innovation: implications for personnel evaluation. *Journal of Personnel Evaluation in Education*, 13(1). Retrieved December 28, 2009, from <http://www.springerlink.com/content/x12v7lwl038376h0/fulltext.pdf?page=1>
- Cognitivism at Learning-Theories.com*. (n.d.). Retrieved November 14, 2009, from <http://www.learning-theories.com/cognitivism.html>

- Commonwealth of Virginia. (2000). *Third grade released English test*. Retrieved June 23, 2007, from <http://www.pen.k12.va.us/VDOE/Assessment/release2000/grade3.pdf>
- Concept to Classroom*. (2004). Retrieved September 2, 2008, from <http://www.thirteen.org/edonline/concept2class/standards/index.html>
- Crafting Curriculum*. (2003). PD Online Course # PD03OC26S25. Retrieved February 15, 2009, from <http://shop.ascd.org/productdisplay.cfm?productid=PD03OC26>
- Cross, C. & Islas, M. (n.d.). *School reform - a nation at risk, reform in action, greater goals better teachers and more accountability*. Retrieved November 1, 2009, from <http://education.stateuniversity.com/pages/2400/School-Reform.html>
- D Trump. (2008, September, 2). What American parents think about public education [Web log post]. Retrieved from <http://www.trumpuniversity.com/blog/post/2008/09/what-american-parents-think-about-public-education.cfm>
- Danielson, L.M. (2009, February). Fostering reflection. *Educational Leadership* 66(5). Retrieved from http://www.ascd.org/publications/educational_leadership/feb09/vol66/num05/toc.aspx
- Darling-Hammond, L. (1997). *Doing what matters most: Investing in quality teaching*. New York, NY: National Commission on Teaching and America's Future.
- Darling-Hammond, L. (2000, January 1). Teacher quality and student achievement: a review of state policy evidence. *Education Policy Analysis Archives*, 8, 1. Retrieved June 3, 2009, from <http://epaa.asu.edu/epaa/v8n1/>

- Darling-Hammond, L., Wise, A.E. and Pease S.R. (1983). Teacher evaluation in the organizational context: a review of the literature. *Review of educational research*, 53, 285-237.
- Daughtry, L., McDaniel, J., & R. Smith. (n.d.). *Virginia standards of learning: curriculum guides*. Retrieved March 2, 2008, from <http://www.pcs.k12.va.us/instruction/sol/index.html>
- Davidson, K., & Decker, T. (2006). *Bloom's and beyond: Higher level questions and activities for the creative classroom*. Marion, IL: Pieces of Learning.
- Developing The Lesson Plan: The Importance of a Lesson Plan*. (n.d.) Retrieved December 9, 2009, from http://www.mysdcc.sdccd.edu/Importance_of_a_Lesson_Plan.htm
- Donahue, P.L., Lutkus, A.D., Allen, N.L., & Campbell, J.R. (2001). *The nation's report card: Fourth-grade reading 2000*. Retrieved March 2, 2009, from <http://nces.ed.gov/nationsreportcard/pdf/main2000/2001499.pdf>
- Duffy, T.M., & Cunningham, D.J. (1996). Constructivism: implications for the design and delivery of instruction. In *Handbook of research on educational communications and technology*. Retrieved November 25, 2009, from <http://iris.nyit.edu/~kkhoo/Spring2008/Topics/Cons/ConstructivismImplications.pdf>
- Dwyer, H., & Igor, A. (1992). *Effects of levels of personalization on reading comprehension*. Retrieved from ERIC database. (ED347985).
- Ed.gov. (2004). *Glossary of terms*. Retrieved December 3, 2009, from <http://www.ed.gov/nclb/index/az/glossary.html#3>

EdSource. (2005). Referenced in Education World, 2005, Seeing the Benefits of Aligning Curriculum, Standards. As reported in Fresno Bee, 10/27/05.

http://www.education-world.com/a_issues/nclbwork/nclbwork053.shtml

EdSource. (2009a). *No child left behind act*. Retrieved December 3, 2009, from

<http://www.edsource.org/1230.html>

EdSource. (2009b). *Scientificallly-based Research*. Retrieved December 3, 2009, from

<http://www.edsource.org/1289.html>

Education Commission of the States. (n.d.). *No child left behind issue brief: Data-driven decsionmaking*. Denver, CO: Education Commission of the States.

Educational Testing Service. (2007). *Test taking strategies for the general test*. Retrieved

June 18, 2007, from <http://www.ets.org/gre/general/prepare/tips/index.html>

Edvantia. (2005). Research brief: aligned curriculum and student achievement. Retrieved

March 19, 2009 from <http://www.edvantia.org/pdta/pdf/Aligned.pdf>

Emberger, M. (2007, February). *Unpacking standards to promote student understanding*.

PowerPoint presented to New Hampshire School Administrators Association..

English Standards: Grade 2. (2002). Retrieved May 26, 2009, from

<http://www.doe.virginia.gov/VDOE/Superintendent/Sols/2002/English2.pdf>

English Standards: Grade 4. (2002). Retrieved May 26, 2009, from

<http://www.doe.virginia.gov/VDOE/Superintendent/Sols/2002/English4.pdf>

English Standards of Learning Framework. (2002). Retrieved April 1, 2009 from

<http://www.doe.virginia.gov/VDOE/Instruction/English/EnglishCF-4.pdf>

Extract from Principles, Policies, and Practices for Quality Education. (n.d.). Retrieved

October 9, 2008, from

<http://www.cityu.edu.hk/QAC/policy/documents/policiesF.pdf>

- Forehand, M. (2005). Bloom's taxonomy: Original and revised. In M. Orey (Ed.), *Emerging perspectives on learning, teaching, and technology*. Retrieved July 25, 2008, from <http://projects.coe.uga.edu/epltt/>
- Fountas, I. C., & Pinnell, G. S. (2006). *Teaching for comprehension and fluency: Thinking, talking, and writing about reading, k-8*. Portsmouth, NH: Heinemann
- Four Pillars of NCLB*. (n.d.). Retrieved May 26, 2009, from <http://www.ed.gov/print/nclb/overview/intro/4pillars.html>
- Franklin, G. (2009, September 20). *Clayton schools to be scrutinized again*. Retrieved December 28, 2009, from 11alive.com website: <http://www.11alive.com/news/education/story.aspx?storyid=135769&catid=11>
- Gillis, C. (1999). *American cultural history: 1970-1979: Education*. Retrieved September 20, 2009, from Lone Star College, Kingwood College Library Web site: <http://kclibrary.lonestar.edu/decade70.html>
- Glatthorn, A. (1999). *Journal of Curriculum and Supervision* (Fall 1999, pp. 26–34).
- Glatthorn, A., Jones, B., & Adams-Bullock, A. (2006). *Developing highly qualified teachers: A handbook for school leaders*. Thousand Oaks, CA: Corwin Press.
- Grider, C. (1993). *Foundations of cognitive theory: a concise review*. Retrieved from ERIC database. (ED372324)
- Hall, T. (2002). *Differentiated instruction*. Wakefield, MA: National Center on Accessing the General Curriculum. Retrieved October 5, 2009 from http://www.cast.org/publications/ncaac/ncaac_diffinstruc.html

- Hamilton, L. S., Stecher, B. M., Marsh, J. A., McCombs, J. S., Robyn, A., Russell, J., Naftel, S., & Barney, H. (2007). *Standards-based accountability under no child left behind: Experiences of teachers and administrators in three states*. Arlington, VA: Rand Corporation.
- Hendricks, K. (1995). *Using higher order thinking skills to improve reading comprehension* (Doctorial dissertation). Retrieved from ERIC database. (ED398538)
- Heubert, J., & Hauser. R. (Eds.). (1999). *High stakes: Testing for tracking, promotion, and graduation*. Washington, D.C.: National Academy Press.
- Hitch, C., & C. Jenkins. (n.d.) *How do I use all this data?* Retrieved February 14, 2010, from Learn NC website: <http://www.learnnc.org/lp/pages/637>
- History of Teaching Reading*. (2004). Retrieved October 11, 2008, from Todays-Learner.com website: <http://www.todays-learners.com/EE-historyofteachingreading.html>
- Hoover, W. (2009). The practice implications of constructivism. *SEDL Letter*, 9, Retrieved November 23, 2009, from <http://www.sedl.org/pubs/sedletter/v09n03/practice.html>
- Huitt, W. (2006). *The cognitive system*. Retrieved November 20, 2009, from Valdosta State University, Educational Psychology Interactive website: <http://www.edpsycinteractive.org/topics/cogsys/cogsys.html>
- Indiana Department of Education. (n.d.) *Definition of Terms*. Retrieved December 3, 2009, from <http://www.doe.in.gov/asap/definitions.html>

- Jacob, B., & Lefgren, L. (2007). In low-income schools, parents want teachers who teach: in affluent schools, other things matter. *Education Next*, 7(3). Retrieved June 3, 2009, from <http://educationnext.org/in-lowincome-schools-parents-want-teachers-who-teach/>
- Jeynes, W. H. (2007). *American educational history: School, society and the common good*. Thousand Oaks, CA: Sage Publications, Inc.
- Johnston, H. (2001). *No child left behind: resources for principals*. Retrieved March 16, 2008, from The Principals' Partnership website: <http://www.principalspartnership.com/feature703.html>
- Jones, K.O., Harland, J., Reid, J.M., & Bartlett, R. (2009). Relationship between examination questions and Bloom's taxonomy. Paper session presented at 39th ASEE/IEEE Frontiers in Education Conference. San Antonio, TX.
- Kagan, D.M. & Tippins, D.J. (1992). The evolution of functional lesson plans among twelve elementary and secondary student teachers. *The Elementary School Journal*, 92, 477-489.
- Kearsley, G. (2009). *Explorations in Learning & Instruction: The Theory Into Practice Database*. Retrieved November 16, 2009 from <http://tip.psychology.org/>
- Kizlik, B. (2008a). *Six common mistakes in writing lesson plans*. Retrieved July 25, 2008, from ADPRIMA website: <http://www.adprima.com/mistakes.htm>
- Kizlik, B. (2008b). *Lesson planning, lesson plan formats and lesson plan ideas*. Retrieved August 17, 2008, from ADPRIMA website: <http://www.adprima.com/lesson.htm>

- Kop, B., & Hill, A. (2008). Connectivism: learning theory of the future or vestige of the past? *International Review of Research in Open and Distance Learning*, 9(3). Retrieved November 25, 2009, from <http://www.irrodl.org/index.php/irrodl/article/view/523/1103>
- Kozlowski, G., Bekkering, E., Jones, K. (2006). *Developing standardized pre/post assessment instruments for measuring course learning outcomes*. Retrieved June 19, 2007, from http://arapaho.nsuok.edu/~ctl/OHETLC/2006/proceedings/KozlowskiBekkeringJones_OKHEC2006/KozlowskiBekkeringJones_OKHEC2006.htm
- Lenz, B. (2009, June 4). What parents think about student achievement. [Web log message]. Retrieved from <http://www.edutopia.org/student-achievement-parents-thoughts>
- Lieberman, J.M. (2002). *The future of teacher compensation: linking salary to national board certification*. Retrieved from ERIC database. (ED479808).
- Liebling, C.R. (1997). *Achieving standards-based curriculum alignment through mindful teaching*. Retrieved from ERIC database. (ED 421497).
- Lindgren, H.C. (1959). Learning theory and teaching practice. *Educational Leadership*, 16(6), p. 333-336. Retrieved November 24, 2009, from http://www.ascd.org/publications/educational_leadership/mar59/vol16/num06/toc.aspx
- Linn, R. (2007, April). *Benchmark assessment: promise or peril?* Paper presented at a symposium at the Annual Meeting of the American Education Research Association. Retrieved from http://www.cse.ucla.edu/products/overheads/AERA2007/linn_benchmark.ppt

- LISD Superintendent's Expectations for New Teachers. (n.d.) Retrieved June 3, 2009, from <http://www.lockhartisd.org/super1/docs/expectations.pdf>
- Lord, T., & Baviskar, S. (2007). Moving students from information recitation to information understanding: exploiting bloom's taxonomy in creating science questions. *Journal of College Science Teaching*, 36, 40-44.
- March, C. (1997). *Key Concepts for Understanding Curriculum*, 2nd ed. (p.164). Bristol, PA : Te Falmer Press
- Massachusetts Department of Education. (2007). *On the Right Track: Aligning Program Curriculum with the Massachusetts ABE Curriculum Frameworks* [PowerPoint Slides]. Retrieved February 15, 2009, from <http://www.doe.mass.edu/acls/dirconf/A9righttrack.pps>
- Marsh, J., Pane, J., & Hamilton, L. (2006). *Making sense of data-driven decision making in education*. Retrieved May 29, 2009, from http://www.rand.org/pubs/occasional_papers/2006/RAND_OP170.pdf
- Marzano, R. J. (2010) Using games to enhance student achievement. *Educational Leadership*, 67(5), pp.71-72.
- Mathers, J.K. (2001). State performance-based accountability systems: a national perspective. Retrieved from ERIC database. (EJ634694)
- Mehrens, W., & Lehmann, I. (1973). *Measurement and evaluation in education and psychology*. New York, NY: Holt, Rinehart, and Winston, Inc.
- Mitchell, F. (1999, April). *All students can learn: Effects of curriculum alignment on the mathematics achievement of third-grade students*. Paper presented at the Annual Meeting of the American Educational Research Association, Montreal, Quebec, Canada. Retrieved from ERIC database. (ED440838)

- Mosier, C., Myers, M., & Price, H. (1945). Suggestions for the construction of multiple-choice test items. *Educational and Psychological Measurement*, 5, 261-271. Retrieved July 27, 2008, from <http://epm.sagepub.com/cgi/login?uri=%2Fcgi%2Fcontent%2Fcitation%2F5%2F3%2F261%3Fck%3Dnck&ck=nck>
- Mott, D. E. (2001). Validity and reliability statement tests for higher standards. Retrieved July 6, 2007, from <http://www.tfhs.net/validity.pdf>
- Nagappan, R. (2000, April). *Language teaching and the enhancement of higher order thinking skills*. Paper presented at the Southeast Asian Ministers of Education Organization Regional Language Centre' 35th International Seminar, Singapore. Retrieved June 8, 2009, from <http://www.nsrajendran.com/documents/articles/RELC2000A.pdf>
- National Board of Professional Teaching Standards. (n.d.). *The five ore propositions*. Retrieved June 8, 2009, from http://www.nbpts.org/the_standards/the_five_core_propositio?print=on
- National Center for Educational Statistics. (2007). *The nation's report card 2007*. Retrieved October 29, 2007, from <http://nces.ed.gov/pubsearch/pubsinfo.asp?pubid=2007496>
- National Commission on Excellence in Education. (1983). *A nation at risk: The imperative for educational reform. An open letter to the American people. A report to the nation and the secretary of education*. Washington, D.C.: Department of Education.

National Institute of Child Health and Human Development. (2000). *Report of the National Reading Panel. Teaching children to read: An evidence-based assessment of the scientific research literature on reading and its implications for reading instruction* (NIH Publication No. 00-4769). Washington, DC: U.S. Government Printing Office.

National Technical Information Service. (1982). *Informational Technology and its impact on American education*. (NTIS No. PB83-174664). Washington, DC: Author.

Nerbovig, M. & Klausmeier, H. (1962). *Teaching in the elementary school* (3rd ed., pp 144-145). New York: Harper & Row.

No Child Left Behind Act of 2001, 20 U.S.C. § 6319 (2008)

No Child Left Behind: Accountability, Assessments, and Transparency. (2008). Retrieved May 26, 2009, from

http://ritter.tea.state.tx.us/nclb/PDF/2008ACET/accountability_assessments_transparency.pdf

North Carolina State Department of Public Instruction. (1999). *Curriculum Alignment*. Retrieved from ERIC database. (ED439526)

North Central Educational Laboratory. (n.d.). *Before, during, after*. Retrieved September 2, 2008, from

<http://www.ncrel.org/sdrs/areas/issues/students/learning/lr2befor.htm>

November, A. (2007, January 30). Three skills students need to be globally competitive. *eSchoolNews*. Retrieved June 10, 2009 from

<http://www.eschoolnews.com/2007/01/30/three-skills-students-need-to-be-globally-competitive/>

Oates, R.H. (2009). How to learn in the 21st century. *Educational Leadership*. 67(1),

Retrieved from:

http://www.ascd.org/publications/educational_leadership/sept09/vol67/num01/toc.aspx

Outcome Verbs. (n.d.). Retrieved April 1, 2009, from

<http://matcmadison.edu/in/outcome-verbs>

Pankratz, R., & Petrosko, J. (Eds.). (2000). *All children can learn: Lessons from the Kentucky reform experience* (p. 109). San Francisco, CA: Jossey-Bass, Inc.

Partnership for 21st Century Skills. (2007, October 10). *U.S. students need 21st century skills to compete in a global economy*. Retrieved May 31, 2009, from

<http://www.21stcenturyskills.org>

Pearson, P. D., & Duke, N. K. (2002). Comprehension instruction in the primary grades.

In C. C. Block & G. M. Pressley (Eds.), *Comprehension instruction: Research-based best practices* (pp. 247-258). New York, NY: Guilford Press.

Pellegrino, J. (2006). *Rethinking and redesigning curriculum, instruction, and*

assessment: what contemporary research suggests. Retrieved July 27, 2008,

from

http://www.skillscommission.org/pdf/commissioned_papers/Rethinking%20and%20Redesigning.pdf

Pennsylvania Department of Education. (2008). Retrieved September 2, 2008, from

http://www.pde.state.pa.us/reading_writing/cwp/view.asp?Q=97891&A=196

Perrone, V. (1985). *Educational equity*. Retrieved from ERIC database. (ED257918)

- Pollock, J. (2007). Replacing hope with certainty. In *Improving student learning one teacher at a time* (Chapter 1). Alexandria, VA: Association of Supervision and Curriculum Development
- Popham, J.W. (2003). *Test better, teach better: The instructional role of assessment*. Alexandria, VA: Association of Supervision and Curriculum Development.
- Praxis Series: For Test Takers. (2009). *Praxis II Test Content*. Retrieved June 2, 2009, from:
<http://www.ets.org/portal/site/ets/menuitem.c988ba0e5dd572bada20bc47c3921509/?vgnextoid=6493a87e0a8b2110VgnVCM10000022f95190RCRD&vgnnextchannel=33e05ee3d74f4010VgnVCM10000022f95190RCRD>
- Praxis Series: Praxis I. (2009). *Virginia: praxis test requirements*. Retrieved June 2, 2009, from
<http://www.ets.org/portal/site/ets/menuitem.c988ba0e5dd572bada20bc47c3921509/?vgnextoid=6493a87e0a8b2110VgnVCM10000022f95190RCRD&vgnnextchannel=33e05ee3d74f4010VgnVCM10000022f95190RCRD>
- Preseisen, B. (1894). *Thinking skills: meanings, models, and material*. Retrieved from ERIC database. (ED257858)
- Quint, J.C, Akey, T. M., Rappaport, S., & Willner, C. J. (2007). *Instructional leadership, teaching quality, and student achievement: suggestive evidence from three urban school districts*. New York, NY: MDRC.
- Raths, J. (2002). Improving instruction. *Theory into Practice*, 41(4), 233. Retrieved October 2, 2009, from ProQuest Education Journals. (Document ID: 256226361).

Rauchway, G., & Altschuler E. (2002). The Virginia history standards and the cold war.

The History Teacher, 35. Retrieved August 31, 2008, from

<http://www.historycooperative.org/journals/ht/35.2/altschuler.html>

Reading Achievement Levels. (2007). Retrieved October 29, 2009, from National Center

for Education Statistics website:

<http://nces.ed.gov/nationsreportcard/reading/achieve.asp>

Research-based Instruction. (2009, February 3). Retrieved December 28, 2009, from

Wrightslaw website: <http://www.wrightslaw.com/nclb/rbi.htm>

Released Test 2001. Retrieved March 2, 2009, from Virginia Department of Education

website:

http://www.doe.virginia.gov/testing/sol/released_tests/2001/test01_english3.pdf

Released Test 2007. Retrieved March 2, 2009, from Virginia Department of Education

website:

http://www.doe.virginia.gov/testing/sol/released_tests/2007/test07_reading3.pdf

Resnick, L.B. (Ed.). (2006). Do the math: Cognitive demand makes a difference.

Research Points: Essential Information fro Education Policy, 4(2), 1-4.

Retrieved from

http://www.aera.net/uploadedFiles/Journals_and_Publications/Research_Points/RP_Fall06.pdf

Robb, L. (n.d.) *The myth of learn to read/read to learn*. Retrieved April 1, 2009 from

Scholastic website:

<http://teacher.scholastic.com/professional/readexpert/mythread.htm>

Roeber, E. (1995). *Critical issues: reporting assessment results*. Retrieved October 9, 2008, from North Central Regional Educational Laboratory website:

<http://www.ncrel.org/sdrs/areas/issues/methods/assment/as600.htm>

Rosenshine, B., & Furst, N. (1973). Research on teacher performance criteria. In B.O. Smith (Ed.), *Research in teacher education: A symposium*. Englewood Cliffs, NJ: Prentice-Hall.

Scantron Corporation. (2006). *Jackson county school system: achievement series*. Retrieved June 22, 2007, from

<http://www.scantron.com/downloads/JacksonCounty-AS.pdf>

Scherer, M. (2005). Perspectives/reclaiming testing. *Educational Leadership*, 63(3), p. 9-10. Retrieved from

http://www.ascd.org/publications/educational_leadership/nov05/vol63/num03/toc.aspx

Schugurensky, D. (Ed.). (2002). *History of education – selected moments of the 20th century: 1963 elementary and secondary school act, the war on poverty, and title I*. Retrieved December 12, 2009, from The Ontario Institute for Studies in Education of the University of Toronto Web site:

http://fcis.oise.utoronto.ca/~daniel_sc/assignment1/1965elemsec.html

Schwebel, A., Schwebel, B., Schwebel, C., & Schwebel, M. (1996). *The student teacher's handbook* (3rd ed.). Mahwah, New Jersey: Lawrence Erlbaum Associates.

Siemens, G. (2005). Connectivism: a learning theory for the digital age. *International Journal of Instructional Technology and Distance Learning*, 2(1). Retrieved November 25, 2009, from http://itdl.org/Journal/Jan_05/article01.htm

- Silver, H., Strong, R., Perini, M., & Tuculescu, G. (2004). *The thoughtful classroom: making students as important as standards*. Retrieved December 11, 2009, from New Horizons fro Learning website:
<http://www.newhorizons.org/strategies/assess/silver.htm>
- Smith, C. & Gillespie, M. (2007). *Research on professional development and teacher change: implications for adult basic education*. Retrieved February 15, 2009 from http://www.ncsall.net/fileadmin/resources/ann_rev/smith-gillespie-07.pdf
- Socratic Questions*. (n.d.). Retrieved February 15, 2009, from Changing Minds.org website:
http://changingminds.org/techniques/questioning/socratic_questions.htm
- Sparapani, E.F. (1999). *Teaching for higher-level thinking: An analysis of teacher reactions*. Retrieved from ERIC database. (ED437343)
- Standridge, M. (2002). *Behaviorism*. In M. Orey (Ed.). Retrieved November 1, 2009, from Emerging Perspectives on Learning, Teaching, and Technology. website:
<http://projects.coe.uga.edu/epltt/>
- State of New Jersey Department of Education: NCLB, School, District, and State Reports*. (2009). Retrieved May 26, 2009, from New Jersey Department of Education website: <http://education.state.nj.us/rc/>
- Stephenson, K. (n.d.). *What knowledge tears apart, networks make whole*. Retrieved November 1, 2008, from <http://www.netform.com/html/icf.pdf>
- Stevens, P.W., & Richards, A. (1992). *Changing schools through experiential education*. *ERIC Digest*. Retrieved from ERIC Database. (ED345929)
- Stiff-Williams, H.R. (2002). Get their attention. *Principal Leadership*(*High School Edition*), 3(3), 18-20.

Stout, M. (2000). *The feel-good curriculum: The dumbing down of America's kids in the name of self-esteem*. Cambridge, MA: Perseus.

Student survey says students don't think their schools' tech is current. (2009, March).

Tech & Learning. Retrieved from <http://www.techlearning.com/article/16880>

Tankersley, K. (n.d.). *Literacy Strategies for Grades 4-12*. Retrieved February 10, 2009, from ASCD website: <http://www.ascd.org/publications/books/104428.aspx>

Teachscape. (n.d.). *Instructional decision-making: why it's important*. Retrieved November 10, 2009, from

<http://www.teachscape.com/tsp/web/orgpreview/oid/8641/asid/71290>

Technology Assistance Document – Virginia Department of Education. (2005). Retrieved March 2, 2009 from Virginia Department of Education website:

http://www.doe.virginia.gov/administrators/superintendents_memos/2005/inf214b.pdf

TeacherVision. (2009a). *Dictionary of educational jargon*. Retrieved December 3, 2009, from <http://www.teachervision.fen.com/pro-dev/new-teacher/48466.html#L>

TeacherVision. (2009b). *Dictionary of educational jargon*. Retrieved December 3, 2009, from [http://www.teachervision.fen.com/pro-dev/new-](http://www.teachervision.fen.com/pro-dev/new-teacher/48466.html?page=2&detoured=1#S)

[teacher/48466.html?page=2&detoured=1#S](http://www.teachervision.fen.com/pro-dev/new-teacher/48466.html?page=2&detoured=1#S)

Texas Education Agency: Curriculum and Educational Programs. (2008). *Curriculum*.

Retrieved May 23, 2009, from Texas Education Agency website:

<http://ritter.tea.state.tx.us/curriculum.html>

The Benefits of Curriculum Alignment. (2004). Retrieved February 15, 2009 from

<http://www.districtadministration.com/viewarticlepf.aspx?articleid=600>

- The Commission on Instructionally Supportive Assessment. (2001). *Building tests to support instruction and accountability*. Retrieved December 7, 2009, from <http://www.testaccountability.org/>
- The Critical Thinking Community. (2009). *The art of redesigning instruction*. Retrieved February 10, 2009, from <http://www.criticalthinking.org/page.cfm?PageID=520&CategoryID=63>
- The Role of Critical Reflection in the Portfolio Process*. (n.d.). Retrieved January 22, 2010, from <http://www.sitesupport.org/module1/teacherreflection.htm>
- Tucker, P. D., & Stronge, J.H. (2005) *Linking student achievement and teacher evaluation*. Alexandria, VA: Association for Supervision and Curriculum Development.
- Tyler, R. (1981). *Curriculum development since 1900*. Retrieved March 2, 2009 from http://www.ascd.org/ASCD/pdf/journals/ed_lead/el_198105_tyler.pdf
- United States Department of Education. (2003). *No child left behind, accountability and adequate yearly progress: national title I directors' conference 2003*. Retrieved June 18, 2007, from Ed.gov website: <http://www.ed.gov/admins/lead/account/ayp2003/edlite-index.html>
- United States Department of State. (n.d.) *Virginia standards of learning and no child left behind*. Retrieved June 23, 2007, from United States Department of State Diplomacy in Action website: <http://www.state.gov/m/dghr/flo/c21998.htm>
- US Department of Education: Fact Sheet. (2004, March). *New no child left behind flexibility: highly qualified teachers*. Retrieved May 31, 2009, from Ed.gov website: <http://www.ed.gov/nclb/methods/teachers/hqtflexibility.html>

US Department of Education: Stronger Accountability. (2004). *Testing: frequently asked questions*. Retrieved May 23, 2009, from Ed.gov website:

<http://www.ed.gov/nclb/accountability/ayp/testing-faq.html#4>

Virginia Department of Education: Accountability Guide. (2010). *Adequate Yearly Progress*. Retrieved from Virginia Department of Education website:

http://www.doe.virginia.gov/statistics_reports/school_report_card/accountability_guide.shtml#ayp

Virginia Department of Education: Instructional Resources. (2010). *Standards of learning resources: standards of learning test blueprints*. Retrieved May 23, 2009, from Virginia Department of Education website:

http://www.doe.virginia.gov/testing/sol/standards_docs/english/index.shtml

Virginia Department of Education: Teacher Education and Licensure. (2005). *Virginia requirements for teachers not new to the teaching profession to meet the definition of highly qualified in the federal core academic areas and special education*. Retrieved June 2, 2009, from Virginia Department of Education website:

http://www.doe.virginia.gov/teaching/licensure/va_requirements_teachers_not-new.pdf

Virginia Reading Assessment. (2007). Retrieved June 2, 2009, from

http://www.va.nesinc.com/PDFs/VRA_Faculty_Guide.pdf

Virginia School Report Card. (n.d.) Retrieved March 25, 2009, from Virginia Department of Education website:

http://www.doe.virginia.gov/statistics_reports/school_report_card/index.shtml

- Wagner, J. & Kumar, A. (2009, January 11). Budget cuts are focus for Md., Va. *The Washington Post*, p. C01.
- Walker, S. (2006, November). *Police accountability: current issues and research needs*. Paper presented at the National Institute of Justice Policing Research Workshop: Planning for the Future, Washington, DC. Retrieved from http://www.emccray.com/uploads/219_1_POLICE_RACKETEERING_Accountability_DoJ_Institute_of_Justice.pdf
- Washburn, K.D. (2006). *Analysis of reading comprehension and thinking process* (Doctoral dissertation). Retrieved from <http://digitalcommons.liberty.edu/doctoral/47/>
- Wells, C. (2007). The rise of physician accountability [Electronic version]. *American Medical Association Journal of Ethics*, 9, 473-475.
- Wenglingsky, H. (2002, February 13). How schools matter: The link between teacher classroom practices and student academic performance. *Education Policy Analysis Archives*, 10(12). Retrieved June 4, 2009, from <http://epaa.asu.edu/epaa/v10n12/>
- Wiles, J. & Bondi, J. (2004). *Supervision: a guide to practice*. New Jersey: Pearson-Merrill Prentice Hall. p. 157-163.
- Wilson, R. (2005). *Teaching reading: a history*. Retrieved October 11, 2008, from Education Oasis website: http://www.educationoasis.com/resources/Articles/teaching_reading.htm
- Whimbey, A. (1984). *The key to higher order thinking is precise processing*. Retrieved January 22, 2010, from http://www.ascd.org/ASCD/pdf/journals/ed_lead/el_198409_whimbey.pdf

Wong, H.K. (n.d.). *There is only one way to improve student achievement*. Retrieved December 10, 2009, from <http://www.newteacher.com/pdf/only1way.pdf>

Wong, H.K., & Wong, R.T. (2005). *How to be an effective teacher: The first days of school*. Mountain View, CA: Harry K. Wong Publications, Inc.

Appendix A

Virginia Grade Four Standards of Learning for Reading

- 4.3 The student will read fiction and nonfiction with fluency and accuracy.
- Use context to clarify meanings of unfamiliar words.
 - Explain words with multiple meanings.
 - Use knowledge of word origins; synonyms, antonyms, and homonyms; and multiple meanings of words.
 - Use word-reference materials, including the glossary, dictionary, and thesaurus.
- 4.4 The student will read and demonstrate comprehension of fiction.
- Explain the author's purpose.
 - Describe how the choice of language, setting, and information contributes to the author's purpose.
 - Compare the use of fact and fantasy in historical fiction with other forms of literature.
 - Identify major events and supporting details.
 - Describe the relationship between text and previously read materials.
 - Identify sensory words.
- 4.5 The student will read and demonstrate comprehension of nonfiction.
- Use text organizers, such as type, headings, and graphics, to predict and categorize information.
 - Formulate questions that might be answered in the selection.
 - Explain the author's purpose.
 - Make simple inferences, using information from texts.
 - Draw conclusions, using information from texts.
 - Summarize content of selection, identifying important ideas and providing details for each important idea.
 - Describe relationship between content and previously learned concepts or skills.
 - Distinguish between cause and effect and between fact and opinion.
 - Identify new information gained from reading.
- 4.6 The student will demonstrate comprehension of information resources to research a topic.
- Construct questions about a topic.
 - Collect information, using the resources of the media center, including online, print, and media resources.
 - Evaluate and synthesize information.

Appendix B

Announcement of Project

Below is a copy of the announcement that appeared in the school newsletter. The original newsletter was not placed in this appendix to maintain confidentiality and anonymity. .

“Two of our fourth grade teachers have been selected to participate in an educational project that will emphasize the use of research-based teaching strategies. We believe this project will help our teachers learn new strategies to use in their classrooms. At the end of the project, the teachers will help determine the best strategies, and they will be made available to all of our teachers. ”

Appendix C

Lesson Plan Template

Lesson Number: Subject: Teacher: Grade: Lesson Duration:

Overview:		Administrator's Objective:	
+			
	Teacher Activities	Student Activities	
SOL Objectives <input type="checkbox"/> Knowledge <input type="checkbox"/> Comprehension <input type="checkbox"/> Application <input type="checkbox"/> Analysis <input type="checkbox"/> Synthesis <input type="checkbox"/> Evaluation			Technology Integration
Procedures Verification <input type="checkbox"/> Oral <input type="checkbox"/> Questions <input type="checkbox"/> Writing <input type="checkbox"/> Project <input type="checkbox"/> Performance <input type="checkbox"/> Test			Materials Needed
Differentiation <input type="checkbox"/> Station Teaching <input type="checkbox"/> Team Teaching <input type="checkbox"/> 1 Teach/ 1 Observe <input type="checkbox"/> 1 Teach/ 1 Assist <input type="checkbox"/> Parallel Teaching <input type="checkbox"/> Alternative Teaching			
Assessment Method <input type="checkbox"/> Teacher Observation <input type="checkbox"/> Portfolio <input type="checkbox"/> Test <input type="checkbox"/> Class Participation <input type="checkbox"/> Group Participation <input type="checkbox"/> Project/ Product			Collaboration
Literature Connection			
Additional Resources			