IMPACT OF LOOPING ON MIDDLE SCHOOL SCIENCE STANDARDIZED ACHIEVEMENT TESTS

by

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Liberty University

A Dissertation Presented in Partial Fulfillment

Of the Requirements for the Degree

Doctor of Education

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ABSTRACT

Tammy M. Barger. IMPACT OF LOOPING ON MIDDLE SCHOOL SCIENCE STANDARDIZED ACHIEVEMENT TESTS. (Under the direction of Dr. Karen Parker, Dean of Education) School of Education, Liberty University, January, 2013.

Looping may be defined as a teacher remaining with a group of students for multiple academic years. In this quantitative study, looping was examined as a factor on science achievement. State-wide eighth grade school level 2010 Pennsylvania System of School Assessment (PSSA) data were used. By responding to a mailing, school administrators indicated if 2010 eighth grade students had or had not been looped. The schools' percentage of advanced and proficient Science PSSA data were used to determine if the independent variable had a significant impact on science achievement. The results of the independent *t*-test analysis suggest that looping does not contribute to science achievement for this study sample.

Descriptors: Looping/Middle school/Science/Standardized achievement tests/ Quantitative

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Praise to my Lord and Savior – I have no doubts that He provides my strength and makes all things possible.

Numbers 6: 24-26 The Lord bless thee, and keep thee: the Lord make His face shine upon thee, and be gracious unto thee: the Lord lift up His countenance upon thee, and give thee peace.

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CHAPTER ONE: INTRODUCTION

Introduction

Note: The following story and statistical data are true; however, the names of the school and principal have been altered in order to protect privacy.

In the fall of 2008, Mr. Smith, the principal of Mountain Middle School, received a phone call from a middle school principal in another school district in Pennsylvania. This principal asked, “What are you doing at Mountain to get your Science PSSA scores so high?” Mr. Smith had not looked at the Pennsylvania System of School Assessment (PSSA) eighth grade Science test scores that closely. But upon examination, the first year of recorded state data (2007-2008 school year) showed that Mountain Middle School’s eighth graders were 78% advanced and proficient in Science when the state average was 52.7%. The Science scores for the other two eighth grades in Mountain’s district, which used the same curriculum and text books, were at 46.2% and 32.2% advanced and proficient for the same test (Pennsylvania Department of Education, 2009).

Immediately after the phone call, Mr. Smith met with the Mountain Middle School’s Science Department faculty, which included this researcher, to brainstorm to identify what was happening at Mountain that was not occurring in the other middle schools in the district. Some of the possible explanations for Mountain’s high achievement on the state standardized science test included: relatively small class sizes, considerable positive parental involvement, generally high achievement on Reading and Math PSSAs, and teachers teaching the same group(s) of students for more than one academic/curriculum year, which is also known as looping.

When considering these possible impacts, many of them could have been related to one or both of the other middle schools in the school district. The unique possibility was looping. The looping at Mountain Middle School occurred as a result of scheduling needs rather than curriculum or instructional design and was utilized across the sixth through eighth grades in reading, math, language arts, social studies, and science. The looping of the years varied upon the scheduling needs of the subject and teacher availability. Looping in any form did not occur in the other two middle schools in the school district.

Background

Looping is known by many names. Multi-year teaching, rotation, two-cycle teaching, student-teacher progression, persistent grouping, progression teams, and multi-year instruction are just a few of these other identities. However, no matter how it is labeled, looping is a form of instructional delivery in which a teacher remains with a group of students for more than one academic school year (Burke, 1997; Elliot, 1998; Forsten, Grant, Johnson, & Richardson, 1997; Gaustad, 1998; George & Lounsbury, 2000; Grant, Johnson, & Richardson, 1996; Hitz, Somers, & Jenlink, 2007; Kerr, 2005; Lincoln, 2000; McCown & Sherman, 2002).

Throughout the late 19th and early 20th centuries, looping was used in the one room schoolhouses found across the United States. The same teacher taught all grades in the town's school, teaching the same students year after year. As the one room schoolhouse evolved to become America's current multi-level educational model, looping was lost from the American education system (Hitz et al., 2007; Lincoln, 1997).

However, other countries' use of multi-year instruction or looping as the basis of their education system continued, often increasing. Japan and China keep students with the same teacher through primary school, another teacher through middle school, and still another teacher throughout high school (Hitz et al., 2007; Kerr, 2002; Little & Little, 2001; Liu, 1997; Thompson, Franz, & Miller, 2009; Whitman, 1999; Yamada, 2007). Germany uses looping as well (Grant et al., 1996; Hitz et al., 2007; Kerr, 2002; Lincoln, 2000).

Why is looping essential to the educational philosophy of these other countries? Around the world, multi-year instruction has provided a strong foundation in educational institutions primarily due to its extensive benefits and positive results, thereby encouraging its continued use. For example, Crosby (1998), Jenkins (2009), McCown and Sherman (2002), and Nichols (2002) agreed that the consistency looping provides in the flow of curricular delivery helps students maintain learning progress. The teacher who moves with the class knows exactly where in the curriculum students need to begin each ensuing year of the loop.

Continuity of teaching styles is a second benefit of looping as identified by Crosby (1998), Forsten et al. (1997), George and Lounsbury (2000), Grant et al. (1996), Hanson (1995), Hitz et al. (2007), Juvonen (2007), Lincoln (1998b), Little and Little (2001), McCown and Sherman (2002), and Nichols (2002). Students become familiar with how their teacher manages the classroom, presents material, and interacts with them. This understanding removes the need to get acquainted at the beginning of the subsequent school years.

Pointing out another key to student-teacher progression, Anderson (1998), Baran (2008), Burke (1997), Coash and Watkins (2005), Fenter (2009), Gaustad (1998), Hegde and Cassidy (2004), Hitz, et al. (2007), Jacobson (1997b), Kerr (2002), Lincoln (1997 & 2000) and Thompson et al. (2009) discussed the creation of stronger and essential relationships between teacher and students, as well as between teacher and parents. According to the National Middle School Association's publication, *This We Believe* (2003), middle school students thrive in environments that are built upon meaningful, respect-filled relationships.

Stemming from these improved relationships, another benefit of looping is the greater sense of belonging or community experienced by students and teachers according to Crosby (1998), Fenter (2009), Hitz et al. (2007), Jacobson (1997a), Kerr (2002) and Nichols (2002). Related to the sense of community that is developed, Crosby and Hitz et al. noted that an increased trust and confidence in the looping student leads to more student participation within the classroom. Without the need to get acquainted at the beginning of the school year (after the first year of instruction in the loop), Coash and Watkins (2005), P. Freeman (2007), Hitz et al., Lincoln (1997 & 1998a), Jordan (2000), Thompson et al. (2009), and Wilcox and Angelis (2009) pointed out that there is gained instruction time. The use of persistent grouping, as indicated by Chirichello and Chirichello (2001), Crosby (1998), Elliot (1998), Forsten et al. (1997), George (2009b), Hitz et al., Kerr (2002), Lincoln (1998b & 2000), McCown and Sherman (2002), Nichols and Nichols (2002), Thompson et al. (2009) and Vann (1997), also allows for a broadened understanding of individual learners' needs by the teacher.

This increased understanding of student needs and abilities allows for increased academic accountability in both attendance and discipline. Teachers are able to increase the skills set of students towards higher academic achievement due to the increased familiarity with the students. Students become more receptive to learning and attend school more frequently; presumably due to the connection they have with the teacher (Forsten et al., 1997; Gaustad, 1998; Jacobson, 1997b). Another area where students show accountability for their education due to the connections within looping is the decline in discipline problems (Fenter, 2009; Forsten et al., 1997; Gaustad, 1998; Jacobson, 1997b; Lincoln, 1998a, 1998b, & 2000; McCown & Sherman, 2002; Nichols, 2002).

Simply put, looping provides the opportunity to teach the whole student, meeting academic, emotional, and social needs, which establishes the opportunity to encourage and enhance achievement (Nichols & Nichols, 2002). The logic of looping is that a teacher who is with a child for more than one academic year naturally possesses background knowledge of that student going into the second year, allowing the student's needs, on all levels, to be addressed more efficiently (Chirichello & Chirichello, 2001). Because teachers stay with their students, they can discover effective techniques for meeting individual academic needs and continue to use them over time. Additionally, teachers and parents are more familiar with each other, allowing for increased communication between school and home (Friedlaender, 2009). With the parents, teacher and school community addressing all of the needs of a student more effectively through looping, the student has the ability to focus more on academics.

Given the opportunities and substantial benefits of looping, many researchers indicated that looping leads to an increase in achievement (Bracey, 1999; Burke, 1996; Chirichello & Chirichello, 2001; Elliot & Capp, 2003; P. Freeman, 2007; Friedlaunder, 2009; Gaustad, 1998; George, 2009b; Gregory, 2009; Jacobson, 1997b; Laboratory At

Brown University, 1997; Lawton, 1996; Lincoln, 1998a, 1998b, & 2000; Liu, 1997; Nichols & Nichols, 2002; Rodriguez & Arenz, 2007; Rotering, 2009; Snoke, 2007; Voyer, 2009; Yamauchi, 2003). Looping, multi-year instruction, persistent grouping, student-teacher progression, by whatever name used to describe this instructional delivery method, creates an educational atmosphere that recognizes and addresses students' academic, emotional, and social needs. These researchers suggested that addressing such needs proactively will lead to increases in achievement over the time of the loop.

Examples where achievement gains are attributed to multi-year instruction have been recorded in recent years and are growing in number. For example, Voyer (2009), a language arts and reading teacher at Dr. Lewis S. Libby School in Milford, Maine, reported that during a sixth through eighth grade loop at her school, students' reading and writing scores "increased dramatically between fourth and eighth grade" (N_A). When examining the use of looping in a high school level family and consumer science program, it was discovered that students who were in looped groups earned all A and B grades while their peers who were not looped earned A, B, C and D grades (Rotering, 2009). In another recent study using the Georgia Criterion Referenced Competency Test, there was a positive correlation found between the presence of a looping group and success on standardized tests (Gregory, 2009).

With the realization of the gains to be made in achievement from looping, in the late 1980s to early1990s, schools across the United States began moving teachers to the next grade with their students. Initially an elementary school practice, looping made its way into middle schools by the mid-1990s (Burke, 1996; Coash & Watkins, 2005;

Crosby, 1998; Elliot, 1998; Gregory, 2009; Kerr, 2002; Lawton, 1996; Lincoln, 1997, 1998 & 2000; McCowan & Sherman, 2002; National Middle School Association, 2003; Peterson, 2001; Sherman, Fitz, & Hofmann, 2002; Yamauchi, 2003). The biggest proponents for the move to looping in middle schools were the teachers. Teachers recognized the value of looping to meet students' academic, as well as emotional and social, needs (Coash & Watkins, 2005; Crosby, 1998; Elliot, 1998; Lincoln, 1997 & 2000; Little & Dacus, 1999). Progressing with students fits the middle school concept. Middle school children experience significant physiological changes and having some consistency in a major aspect of their life provides stability in an otherwise chaotic time (McCown & Sherman, 2002).

Other Considerations

Looping is not the only factor that could account for the variance in Science achievement. In fact, school specific variables are just a portion of the factors that affect a middle school student's achievement. Some of the influences in the big picture come from the school community, while other influences are exogenous to the local school. Figure 1 shows the scope of the relationships that impact a middle school student based upon the review of literature for this study (Anderson, 1998; Balfanz, Mac Iver, & Byrnes, 2006; DePlanty, Coulter-Kern, & Duchane, 2007; Feldman & Ouimette, 2004; P. Freeman, 2007; George, 2009b; George & Alexander, 1993; Juvonen, 2007; Juvonen, Le, Kaganoff, Augustine, & Constant, 2004; Liu, 1997; Marchant, Paulson, & Shunk, 2006; Miller, 2003; National Middle School Association, 2003; National Research Council of the National Academies, 2006; Odom, Stoddard, & LaNasa, 2007; Okpala, Smith, Jones, & Ellis, 2000; Patz, 2006; Peterson, 2001; Reilly, 2008; Schroeder, Scott, Tolson, Tse-

Young, & Yi-Hsuan, 2007; Wentzel, 2010; Wilcox & Angelis, 2009; Wiles & Bondi, 2001).

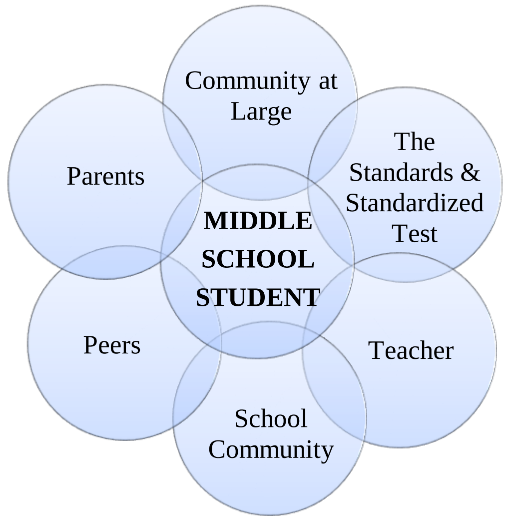

Figure 1. Relationships that influence a middle school student's academic success

Parents send their children to school where they interact with their peers, teachers and other members of the school community. Teachers work to meet student academic needs by preparing curriculum driven by assessment standards created by the state government, which are assessed through the use of standardized tests. All of these relationships, directly or indirectly apparent to the student, are possible variables impacting achievement (Feldman & Ouimette, 2004; P. Freeman, 2007; George, 2009b).

When considering the school community portion of the figure, it cannot be ignored that other school-specific influences on student achievement exist. Other possible school-linked factors, intrinsic to the school or to the student, impacting student achievement are: attendance, student knowledge base, student cognitive ability, student testing ability (Anderson, 1998; Feldman & Ouimette, 2004; P. Freedman, 2004; George & Alexander, 1993; Juvonen, Le, Kaganoff, Augustine, & Constant, 2004; Miller, 2003;

National Middle School Association, 2003; Okpala, Smith, Jones, & Ellis, 2000; Peterson, 2001; Wilcox & Angelis, 2009; Wiles & Bondi, 2001). Still more possible factors identified by the same authors are school administrative leadership, homogeneous versus heterogeneous (ability) grouping, school organization, school vision or philosophy, curriculum, textbooks, facilities, and student interest in the subject.

Directly linked to the school and student is the teacher. The teacher is a very prominent stakeholder in the success of a middle school student. Some influential components of the teacher, which can be potentially linked to student success, include: the attributes of the teacher, style of instruction delivery, expectations, experience level, professional development. Also found to be contributing factors for the success of the middle school student are classroom management, content knowledge, pedagogical knowledge, and relationship with the student and parents (Balfanz, Mac Iver, & Byrnes, 2006; George & Alexander, 1993; Juvonen et al., 2004; Liu, 1997; Miller, 2003; National Middle School Association, 2003; Odom, Stoddard, & LaNasa, 2007; Okpala et al., 2000; Schroeder, Scott, Tolson, Tse-Young, & Yi-Hsuan, 2007; Wentzel, 2010; Wilcox & Angelis, 2009; Wiles & Bondi, 2001).

Furthermore, other members of the school community, such as peers play a role in a student's ability to succeed academically. Peer relationships are especially influential at the middle school level. A primary goal of adolescence is learning where one fits into the crowd (George & Alexander, 1993; Juvonen, 2007; Juvonene, et al., 2004; Little & Dacus, 1999; Wilcox & Angelis, 2009; Wiles & Bondi, 2001).

Perhaps the most important shareholders of a child's education are the parents/guardians. Parents continue to have a significant role in the life of their child during the middle school years. Areas where parents must continue to positively impact middle school students to enhance achievement include providing basic needs; a safe, healthy home environment; and continued emotional support through the trying years of adolescence. Parents' income and education level impact student achievement and need to be considered when examining student achievement in the standardized testing arena (Marchant, Paulson, & Shunk, 2006).   As well as providing basic needs in the home, parent involvement in the school community is an additional key factor in student achievement (DePlanty, Coulter-Kern, & Duchane, 2007; George, 2009b; George & Alexander, 1993; George & Kaplan, 1998; Juvonen et al., 2004; National Middle School Association, 2003; Okpala et al., 2000; Peterson, 2001; Reilly, 2008; Wilcox & Angelis, 2009; Wiles & Bondi, 2001; Wynne & Walburg, 1994).

Another facet of the big picture is the community at large. This holds a two-fold impact: the involvement of the local community (George, 2009b) and, perhaps more importantly, government involvement in education. NCLB (2001) contains the federal government's mandates for education in America. Schools must show that students make academic progress each year, with the goal being that all students be deemed proficient in reading and math by 2014. State governments have established standards in all subject areas, which schools are expected to be teaching.   The student knowledge of the standards is then assessed via standardized tests to prove that Adequate Yearly Progress (AYP) has or has not been attained. The government's NCLB mandate instituted the use of standardized tests to assess student progress; therefore, the standardized test itself must be considered a variable and influencing factor in student achievement. The design and proctoring of standardized tests has a critical impact on the ability to use the data collected from the administration and evaluation completed with the tests (Patz, 2006; National Research Council of the National Academies, 2006).

Still another consideration is the grade level at which the study's test results occurred. The test results that are being examined for this study are from the eighth grade level, which lies within the middle school arena. In the 1960s, it was recognized that adolescents have specific social and emotional needs that should be addressed in the academic realm; thus, the middle school concept was born (George & Alexander, 1993). The middle school movement was supported by others over the years and these beliefs hold true today (Anfara & Schmid, 2007; Anfara, 2009; Dougherty, 1997; Faulkner & Cook, 2006; George, 2009a, 2009b, & 2010; Juvonen et al., 2004; Lounsbury, 2009 & 2010; Meeks & Stepka, 2005; Morocco, Bringham, & Aguilar, 2006; National Middle School Association, 2003; Peterson, 2001; Romano & Georgiady, 1997; Rottier, 2000; Springer, 2009; Wilcox & Angelis, 2009; Wiles & Bondi, 2001).

Problem Statement

Despite the plethora of other possible influences on achievement, and how diversely the middle school concept is being interpreted and/or applied in schools across the United States, the question posed in this study was: Does looping have an impact on science achievement as evaluated through standardized test scores? The literature on looping was qualitatively clear that looping has benefits in the middle school; however, the quantitative support was scant and often inconclusive. This study served to quantitatively add to the discussion addressing the question of the instructional delivery method of looping.

This study created its population based upon voluntary responses to a mailing sent to administrators of schools that contained eighth grade students in the 2009-2010 school year. Administrators responded regarding whether or not looping occurred with those eighth grade students from sixth through eighth grades and in which subjects. Schools in the experimental group specifically looped in at least the subject area of science. As reported by school administrators, schools in the comparison group did not utilize looping.

Purpose Statement

The purpose of this study was to ascertain the statistical significance of looping on achievement based on science standardized test scores. School level data for eighth grade test results, found publically on the PDE website (www.education.state.pa.us) were used in an independent *t*-test. School administrators were asked whether or not their eighth grade students have experienced looping. Administrators that responded affirmatively were asked additional questions pertaining to the specifics of looping in their school, including grades and subjects looped. Using the responses of school administrators, in that looping did or did not occur with the 2009-2010 eighth grade students of their school, schools were placed into study groups for analysis. After study group placement, the schools' PSSA Science data, percent advanced and proficient, were placed in an independent *t*-test. The independent variable used in the model was looping versus non-looping.

Significance of Study

This study was to shed new light on the effectiveness (or ineffectiveness) of looping. Today's education world is driven by NCLB's focus on the use of scientifically research-based instructional practices and, more importantly, achievement on standardized tests. Because of this, knowledge of easily implemented, inexpensive, research-based curriculum delivery practices is essential to all educators and school administrators. The goal of this study was to provide quantitative support or disapproval for the use of looping with regards to achievement on standardized science tests. As Juvonen et al. (2004) stated the purpose is to possibly move this instructional delivery strategy from “promising to proven” (p. 21).

By providing quantitative knowledge, this study will assist school administrators and educators in developing their school structures and teaching methods. The findings from this study can be used in making important decisions at every level of the educational realm from the school level to the school district level. NCLB (2001) states that educators need to use research-based techniques. Future research can be conducted to further examine the impacts of looping on achievement.

Research Question

Does the practice of looping within a school impact achievement on PSSA Science assessments as compared with schools that do not implement the instructional delivery practice of looping?

Research Hypothesis

Null Hypothesis.

There will be no significant difference in Science PSSA test scores between students who have experienced the practice of looping and those who have not.

Identification of Variables

Looping is a form of instructional delivery where a teacher remains with a group of students for more than one academic school year (Burke, 1997; Elliot, 1998; Forsten et al., 1997; Gaustad, 1998; George & Lounsbury, 2000; Grant, et al., 1996; Hitz et al., 2007; Kerr, 2005; Lincoln, 2000; McCown & Sherman, 2002). Looping requires a minimum of two years; however, in a middle school setting a loop could cover three years. Looping can also occur across various subjects.

This study will use data from the Pennsylvania standardized science test. The PSSA assessment is the “standards-based, criterion-referenced assessment used to measure a student's attainment of the academic standards while also determining the degree to which school programs enable students to attain proficiency of the standards” (PDE, 2011, para. 2). This assessment is to be given under specified conditions and in a specific time frame as defined by the Pennsylvania Department of Education (PDE). Additionally, all tests are scored in a manner prescribed by PDE. Therefore, the PSSA assessment is considered standardized (USLegal.com, 2011).

The PDE defines acceptable levels of achievement on PSSAs as advanced and proficient, regardless of the subject and/or grade level of the test taken. The benchmarks for the levels of advanced, proficient, basic, and below basic are established by the PDE and vary depending on content area of test (PDE, 2011). Each subject area assessed with PSSA assessments has its own set of cut scores. Cut scores are where the separations between advanced, proficient, basic, and below basic levels are placed.

CHAPTER TWO: LITERATURE REVIEW

Introduction

Looping – also known as: multi-year instruction, multi-year teaching, rotation, two-cycle teaching, and student-teacher progression – has been used in American education since the time of the one-room schoolhouse (Hitz et al., 2007; Lincoln, 1997). As the educational system became more complex and multi-roomed, this technique was virtually lost. However, looping regained momentum in the late twentieth century as it became a strong component of working with younger students (Grant, Johnson & Richardson, 1996). If teachers worked in the elementary level during the 1990s, more than likely they were familiar with the term *looping*. Teachers at other levels typically were not exposed to the concept; however, in some parts of the country looping was being successfully implemented in the middle grades as well as at the elementary level (Burke, 1997; Forsten, Grant, Johnson, & Richardson, 1997; Gaustad, 1998; Lincoln, 1997).

For those out of the loop (pun intended), the term *looping* was originated by Jim Grant, director of the Society of Developmental Education (Lincoln, 2000). Grant, an educator and principal for nearly twenty years, advocates on behalf of children to form learning environments that promote academic success (Staff Development for Educators, 2012). In *The Looping Handbook: Teachers and Students Progressing Together*, Grant (1996), along with Bob Johnson and Irv Richardson, discussed the essential components for implementing looping. Grant, Johnson and Richardson also identified the fundamental reasons for looping to be used, while recognizing the primary stakeholders and incorporating them into successful implementation. Also presented in *The Looping Handbook* are the benefits of looping and things to consider before implementation occurs. The operational definition of looping is provided in *The Looping Handbook* and is recognized by others (Elliot, 1998; Gaustad, 1998; Hitz, Somers, & Jenlink, 2007; Kerr, 2005; Lincoln, 2000; McCown & Sherman, 2002; Nichols & Nichols, 2002; Vann, 1997; Yamauchi, 2003). Looping is when the teacher moves from one grade to the next along with her students for at least two years of teaching and learning.

The basic premise of looping is built upon the same reasoning that parents do not take their child to a new doctor every year. A child typically remains with the same doctor because consistency in medical care ensures proper treatment of the child (Burke, 1996). The same principle applies to education. When there is promotion of the teacher with the class, it enhances the relationship between the student and teacher, which in turn allows for greater effectiveness by the teacher in meeting the needs of individual learners (Coash & Watkins, 2005; Crosby, 1998; Elliot, 1998; Gaustad, 1998; Hegde & Cassidy, 2004; Hitz et al., 2007; Kerr, 2005; Lawton, 1996; Lincoln, 1997, 1998, & 2000; Liu, 1997; McCown & Sherman, 2002; Yamauchi, 2003).

Nichols & Nichols (2002) equated the relationships established through looping to being able to teach the whole student, which ultimately increases achievement. Teaching the whole child means addressing the child's academic, social, and emotional needs which ultimately creates not only a good learner, but a good citizen (Kohn, 2010). This becomes the basis of the middle school concept. The meshing of elementary level (nurturing) and high school level (content-based) values in a transitional arena which enables personal and academic growth (George & Alexander, 1993). The whole person relationship builds citizenship skills with the creation of a mutually respectful bond, which over time decreases behavior problems and allows increases in academic performance (Beaty-O'Ferrall, Green, & Hanna, 2010). Anfara (2003) stressed the importance of teaching the whole child through developmentally appropriate instructional strategies, interdisciplinary teaming, flexible scheduling and an exploratory curriculum, which are all fundamental components of successful implementation of the middle school concept.

Theoretical Framework

Middle school pioneers saw middle school as a transitional environment for personal, social and academic growth. Therefore, the middle school concept is entrenched theoretically across the cognitive, behavioral, constructivist, and humanist paradigms. From each paradigm a primary theory shows support for the conceptual undertakings of the middle school construct. These same theories also show credence to the instructional delivery method of looping.

Piaget made detailed observations of children and developed the Stage Theory of Cognitive Development (Learning Theories Knowledgebase, 2010e; McLeod, 2009). He identified four stages through which children pass as they mature cognitively to become adults. With regards to middle school students, two stages of the theory are involved: concrete and formal. During the concrete stage children are able to conceptualize ideas and begin to build more abstract logic. Therefore, early middle school students are beginning to make sense of their experiences. When children reach the formal stage, their thinking and learning is more like adults in that they are able to think abstractly and utilize deductive reasoning (Learning Theories Knowledgebase, 2010e; McLeod, 2009).

This shift in cognitive development needs to be recognized when working with middle school students.

Behaviorally, the middle school concept embraces Bandura's Social Learning Theory. Bandura's Social Learning Theory simply states that behavior is learned from other individuals in the environment. Once a behavior is observed, it can be replicated for the individual's use if and when there is reason to use it. An important aspect of behavior replication is reinforcement – whether positive or negative (Learning Theories Knowledgebase, 2010d; McLeod, 2011). A key to the middle school concept is allowing students to learn from each other and with the teacher providing appropriate reinforcement.

While components of the cognitive and behavioral theory paradigms permeate the middle school concept, a primary focus of the middle school concept's theoretical background is in the constructivism realm. Proponents of the middle school concept see a need for learning to be built upon existing knowledge (National Middle School Association, 2003). Further, the linking of that knowledge to new knowledge is based upon active engagement in the learning process. The work of Russian psychologist Vygotsky is the basis for the constructivism paradigm.

Vygotsky's focus on learning reflects that social interaction is vital to developing cognitive ability. The Social Development Theory was built upon the pretense that community and culture and the interaction therein is a precursor to cognitive development. In other words, when a child has positive interactions with parents, teacher, and peers, the child will have enhanced cognitive development (Learning Theories Knowledgebase, 2010c; McLeod, 2007b). Vygotsky's Social Development

Theory has two primary facets: **More Knowledgeable Other** (MKO) and the Zone of Proximal Development (ZPD). The concept of MKO is simply that – one who maintains more knowledge than another. It is important to note that this could be a teacher to a child in the classroom, a child to another child in the same classroom, or an electronic device that holds information to which an individual needs access (McLeod, 2007b).

Perhaps more directly related to the middle school concept, is the ZPD. This is the area between which an individual needs assistance solving a problem and when he is able to solve the problem without assistance. The essential use of this ZPD, according to Vygotsky, is to develop appropriate skills and strategies to move the individual from needing help to being able to attain higher order thinking skills and, therefore, complete more and more tasks independently (Learning Theories Knowledgebase, 2010c; McLeod, 2007b). Vygotsky's ZPD further supports looping as the teacher's knowledge of the student's ability in the progressive instructional year allows for more advancement through the Zone.

Directly linked to Vygotsky's work is the theory developed by Bruner called Discovery Learning. The focus is inquiry-based learning in which the individual constructs connections based upon prior knowledge and figuring things out on one's own. The role of the teacher shifts from instructor to guide (Learning Theories Knowledgebase, 2010a; McLeod, 2008). Discovery Learning ties to the middle school concept in providing developmentally appropriated and engaging learning opportunities.

Finally, the theoretical paradigm of humanism is vastly relevant to the middle school concept and, subsequently, looping. The humanism theory of focus is Maslow's Hierarchy of Needs (Maslow, 1943). Maslow in essence states that humans will work at a higher level of achievement when their basic needs are met. Maslow's Hierarchy of Needs consists of five levels of need which are depicted in a pyramid with the most basic needs being at the base and extending up to the highest level of need. From the base to the top of the pyramid, the Hierarchy of Needs is: biological and physiological needs, safety needs, belongingness and love needs, esteem needs, and self-actualization needs. The lower four levels of needs are considered deficiency needs and the upper level is the growth need (Learning Theories Knowledgebase, 2010b; McLeod, 2007a).

The premise of Maslow's Hierarchy of Needs is that if an individual lacks these basic needs that lead the individual to be motivated to fulfill them (Learning Theories Knowledgebase, 2010b; McLeon, 2007a). The uppermost level of the pyramid, and the most fulfilling need, according to Maslow, is the need for self-actualization. This is the ability of an individual to realize his full potential, seek self-fulfillment and personal growth (Learning Theories Knowledgebase, 2010b; McLeon, 2007a).

Middle school administrators and educators need to be fully aware of the needs of students. If a child comes to school without his basic needs having been met, Maslow indicates the child's ability to focus on the lesson will be diminished. After basic needs are met, the child needs to feel comfortable in his surroundings which will enable him to more readily engage in learning (Learning Theories Knowledgebase, 2010b; McLeon, 2007a). It is important to establish a sense of belonging and provide the child with appropriate relationships. Additionally, the child needs to see worth in what he is doing as a member of the school community in order to establish achievement. And when these deficiency needs are met, the child will be able to move to the growth need and work to his full potential.

The process of looping creates a community of learners. This community allows for the development of positive relationships among the teacher, students, administrators and parents as established in Vygotsky's Social Development Theory (Learning Theories Knowledgebase, 2010a; McLeod, 2008). As these stake holders have interaction beyond one school year, a level of trust and rapport is created that is not achievable within a traditional rotation of classes. The social interactions of the community members broaden the ability for cognitive connections to be made.

In a qualitative study, Booth (2011) examined the relevance of Maslow's Hierarchy of Needs to middle school students. In response to Booth's questions, middle school students revealed their primary concerns as the following: physical development and growth, safety, academic, and esteem. These student concerns, discovered through Booth's study, include the biological and physiological needs, safety needs, and esteem needs levels of Maslow's Hierarchy of Needs. This study added credence to the use of looping as looping provides avenues for students to meet their deficiency level needs. Looping establishes a safe and secure environment and a sense of community and belonging through extended relationships.

Theoretically speaking, the middle school concept is strongly anchored in Piaget, Bandura, Vygotsky, Bruner, and Maslow. Within the constructs of this theoretical stronghold, looping is also well established as this researcher demonstrates in Figure 2. The primary factor in the use of looping is that the teacher moves forward with the class. In successive instructional years, the teacher then has knowledge of the curricular history as well as knowledge of each student's academic ability. This knowledge provides a basis for the teacher to have an understanding of individual learner's cognitive development (Piaget's theory), an ability to make connections between prior knowledge and new content (Vygotsky's theory), and a means to appropriately deliver instruction to the young adolescent (Bruner's theory). The extended time provided by looping allows the development of appropriate behaviors and ample reinforcement of behaviors and learning (Bandura's theory). In addition, the relationship established with looping allows the teacher to be more aware of each student's basic needs (Maslow's theory).

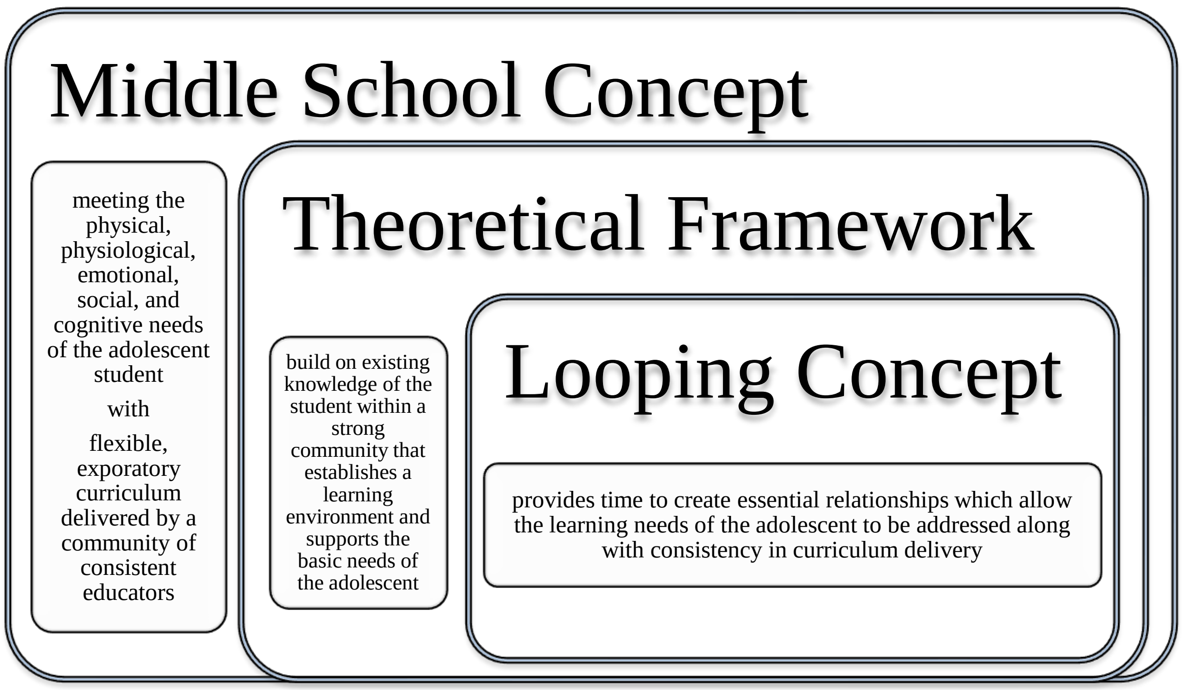

Figure 2. Connecting the middle school and looping concepts to theory

Review of Literature

The Middle School Concept.

William M. Alexander fathered the middle school concept in 1963. The goal was to shift from the junior high philosophy to a more developmentally appropriate instructional delivery model (Dougherty, 1997; Wiles & Bondi, 2001). Four characteristics of the junior high would be retained and three new characteristics would be added to create the middle school concept. The middle school would remain the transition between elementary and high school and maintain programming adapted for the pre-adolescent and early adolescent student. Additionally, it would preserve exploratory opportunities and continue to deliver general education emphasizing cognitive development. The three new attributes the middle school would incorporate would be: (1) providing the student with an adult who knows him well and provides individual attention, (2) allowing for flexible curriculum in an environment that develops motivation to learn, and (3) implementing school activities which develop appropriate values (Dougherty, 1997).

The middle school concept was implemented and, thirty years later, Alexander was joined by George in the release of a book titled *The Exemplary Middle School* (1993). The goals of the middle school concept remained the same. Middle schools fully implementing the concept were continuing general education with opportunities for exploration, providing teacher-based guidance to students, allowing flexible curriculum, and emphasizing character development. George and Alexander stressed that middle schools should strive to reach learning goals in the curriculum with age appropriate knowledge, skills and attitudes. Additionally, they emphasized that middle schools should provide a facet of group citizenship to develop the student's understanding and feeling of belonging to a group.

In 2003, the NMSA published *This We Believe: Successful Schools for Young Adolescents.* In this document, the NMSA emphasized the importance of middle level education, established characteristics of successful middle level schools and stated what successful middle level schools must provide young adolescents. The role of middle level education is to provide the scaffolding to move a student from elementary to high school. The NMSA called educators to action to fully implement the middle school concept promoting the success middle level education for young adolescents (NMSA, 2003).

The foundational component of the middle school concept is the understanding that the pre-adolescent and early adolescent child is transitioning through tremendous developmental changes (George & Alexander, 1993; Juvonen, Le, Kaganoff, Augustine & Constant, 2004; Lounsbury, 2009; NMSA, 2003). The success of the middle school student hinges on the ability of the teachers and administration of the school to accept the vast differences in the middle school student's thinking ability. Reflecting back to Piaget's Stages of Cognitive Development, middle school students are changing from concrete to more conceptual thought processes. Because of this jump in development from concrete to abstract and conceptual thinking, it is during the middle school years that there is the greatest variability in the rate of student learning (Lounsbury, 2009; Romano & Georgiady, 1997).

According to NMSA (2003), teachers and administrators should keep in mind how the young adolescent is developing, and thus build specific characteristics into the middle school community to ensure student success. These characteristics are built around all stakeholders in the middle school community. An important characteristic that establishes the ability of the teacher to promote appropriate development of the ever changing middle school student is proper training and continued professional development. This professional development should be focused on the young adolescent which creates experts in the field of middle level education (Andrews & Jackson, 2007;

Anfara, 2009; Anfara & Schmid, 2007; Feldman & Ouimette, 2004; Jackson, 2009; Juvonen et al., 2004; McEwin & Green, 2010; Meeks & Stepka, 2005; Miller, 2003; NMSA, 2003; Peterson, 2001).

The middle school faculty does need ongoing professional development, but they also need support and strong leadership from their school administration. Administrative support needs to come to the middle school from all levels – state, district and school administrators (Meeks & Stepka, 2005). The state and district level administrators need to, along with the middle level administrators, recognize and support the middle school concept with full implementation for the middle level student to reap all benefits of the middle school structure (Anfara, 2009; Erb, 2006; Juvenon et al., 2004; Meeks & Stepka, 2005; Miller, 2003; NMSA, 2003; Peterson, 2001).

To ultimately reach the goal of having successful middle school students, a shared vision and mission for the middle school needs to be held by all members of the middle school community. The vision and mission statement should guide decision making with regards to the progress and development of the middle school community. The focus of the vision should be creating a school culture for learning and appropriate development of the young adolescent. This shared vision places all stakeholders in a role of responsibility for the success of the student (Andrews & Jackson, 2007; Dougherty, 1997; Feldman & Ouimette, 2004; Jackson, 2009; NMSA, 2003; Wilcox & Angelis, 2009).

By developing a collective vision for the middle school community, the school community takes on the responsibility to establish a successful middle school. The school community can then incorporate the characteristics of a successful middle school into the plan and vision such as interdisciplinary teaming, flexible scheduling, looping, advisory programs and parental involvement. (Andrews, 2008; Anfara, 2003; Juvonen et al., 2004; NMSA, 2003; Rottier, 2000). Additionally, a shared mission to provide a successful middle school will offer an inviting, supportive environment (Andrews & Jackson, 2007; Booth, 2011; George, 2009a; Jackson, 2009; NMSA, 2003; Peterson, 2001; Ziomek-Daigle & Andrews, 2009), family and/or community partnerships (Andrews & Jackson, 2007; Dougherty, 1997; George, 2009a; Jackson, 2009; Juvonen, 2007; Juvonen et al., 2004; NMSA, 2003; Peterson, 2001; Reilly, 2008; Roney, Brown, & Anfara, 2004; Yamauchi, 2003; Ziomek-Daigle & Andrews, 2009), and other programs for safety, wellness and health can be launched (Juvonen, 2007; NMSA, 2003; Roney et al., 2004).

Because of the fluctuation in learning rate that dominates the middle school realm, it is critical to provide the middle school student stability through active advisory programs and guidance. The development of a student advisory program is a fundamental tenet of the middle school concept (Anfara, 2003; Dougherty, 1997; George & Alexander, 1993; Juvonen, 2007; Juvonen et al., 2004; Lincoln, 1998a; McEwin & Green, 2010; NMSA, 2003; Peterson, 2001; Ziomek-Daigle & Andrews, 2009). The focus of the advisory program is to provide each middle school student an adult (teacher or guidance counselor) with whom a caring relationship is developed. This advisor is to serve as a sounding board for the academic choices, as well as guidance navigating, interpreting and/or putting into perspective other obstacles to enable development socially and emotionally to the next stage of life (Dougherty, 1997; Juvonen et al., 2004; NSMA, 2003). A study focused on dropout prevention in the middle school stressed the importance of advisory programs including a transitional component from the middle school to the high school (Ziomek-Daigle & Andrews, 2009).

Successful middle schools also hold high expectations for all community members (NMSA, 2003). Middle level educators must be held accountable for knowing each middle level student's abilities, the content which needs to be taught, and the cognitively appropriate pedagogical means by which to present the content (Andrews, 2008; Andrews & Jackson, 2009; Anfara & Schmid, 2007; Dougherty, 1997; Faulkner & Cook, 2006; NMSA, 2003). Administrators at the middle school level must be held to a high standard of understanding the middle school student's academic, social, and emotional needs as well, and ensure developmentally appropriate practices and staff are in place to meet those needs (Anfara & Schmid, 2007; Erb, 2006; Meeks & Stepka, 2005; NMSA, 2003). Students need to be held to high expectations so the development of fluent thinking occurs over the time spent in middle school (NMSA, 2003; Springer, 2009).

In addition to instilling the aforementioned middle school characteristics, a successful middle school must also provide students with academic curricula that are relevant, student-centered, exploratory, integrative, and actively engaging (Andrews, 2008; Andrews & Jackson, 2007; Anfara, 2003; Anfara, 2009; Booth, 2011; George, 2010; Jackson, 2009; NMSA, 2003). In order to meet the academic requirements of middle school students, innovative teaching strategies or activities are often employed (Andrews & Jackson, 2007; Anfara & Schmid, 2007; Dougherty, 1997; Faulkner & Cook, 2006; George, 2009a; Jackson, 2009; Juvonen, 2007; McEwin & Green, 2010; Miller, 2003; NMSA, 2003). Although the history of teacher rotation is well established, some consider looping to be an innovative instructional delivery tool which will lead to the use of more innovative methods (Elliot, 1998).

How can having an engaging, exploratory, relevant curriculum that is taught using innovative teaching strategies be better? The curriculum should be delivered by a teacher who possesses expert level skills in content, pedagogy, and knowledge of the middle school student. Moreover, how can that curriculum and teacher be even more effective? The NMSA (2003) stated the curriculum and teacher are strengthened when placed in an enriching learning community due to organizational structure. The focus of the middle school concept infrastructure is the creation of meaningful relationships to support the development of the middle school student (Erb, 2006; McEwin & Green, 2010; NMSA, 2003). The first keystone to the middle school concept's organizational structure is the use of interdisciplinary teaming (Anfara, 2003; Dougherty, 1997; Feldman & Ouimette, 2004; George, 2009a; George & Lounsbury, 2000; Juvonen, 2007; McEwin & Green, 2010; Meeks & Stepka, 2005; Romano & Georgiady, 1997; Rottier, 2000; Wiles & Bondi, 2001; Yamauchi, 2003). The interdisciplinary teams are typically comprised of the core subject area teachers who work with a set group of children and are allowed common plan time (NMSA, 2003). A supporting beam to the interdisciplinary team is the ability for the team to utilize flexible scheduling (Anfara, 2003; McEwin & Green, 2010; Springer, 2009; Wiles & Bondi, 2001).

One organizational structure for middle schools and especially large schools, in general, is called a school-within-a-school. Going back to the premise of the one-room schoolhouse where small was the norm, schools create schools-within-a-school or sub-schools to promote close-knit learning communities made of small groups of students and teachers (Anderson, 1998; Anfara & Schmid, 2007; Anfara, 2003Burke, 1996; Balfanz, Mac Iver, & Byrnes, 2006; P. Freeman, 2007; George & Lounsbury, 2000; Juvonen, 2007; NMSA, 2003).

Another school organizational structure or instructional delivery method which builds a sense of community for the learning environment in the middle school is looping (NMSA, 2003). Looping is closely connected to the theoretical framework of the middle school concept. Looping allows for the development of a close relationship between a student and an adult for an extended period of time (Anderson, 1998; Balfanz et al., 2006; George, 2009a; George & Lounsbury, 2000; Lincoln, 1998a; McCown & Sherman, 2002; Peterson, 2001; Sherman, Fitz, & Hofmann, 2002; Wilcox and Angelis, 2009).

The final provision necessary for a successful middle school is appropriate evaluation and assessment measures (NMSA, 2003). Independent of the mandates for assessment by No Child Left Behind Act of 2001 (NCLB), it is especially important for the use of teaching strategies and instructional practices to be monitored at the middle level. Monitoring teaching strategies and instructional practices ensures students are grasping the academic concepts being presented (Faulkner & Cook, 2006; Roney et al., 2004).

The Middle School Problem.

Successful implementation of the middle school concept adheres to the previously discussed characteristics and provisions. When the middle school concept is fully implemented in the middle school environment, an increase in achievement can be documented (Lounsbury, 2009). However, there is a problem with the success of the middle school: between the fourth and eighth grades, there is a marked drop in academic performance (Wilcox & Angelis, 2009). Despite great strides to meet the academic, social, emotional and physiological needs of the pre- and early-adolescent child, the middle school concept has apparently fallen short on overall delivery.

As noted by Anfara (2003), the usual culprits pointed to *as the problem* within middle level education are lack of middle school teacher preparation, textbooks, unmotivated teachers, and the structure of middle schools. However, Anfara stipulated that a *proper* concern is that there was a shift to *middle school* with only a *facelift* of the middle school concept reform being applied on a large scale. The effectiveness of a program hinges on the complete implementation of that program (Juvonen et al., 2004). Hence, partial implementation has been pointed to as the cause for the middle school concept's demise (Anfara, 2009; McEwin & Green, 2010; Meeks & Stepka, 2005). Juvonen (2007) stated that "the organizational structure and size of schools do not support the implementation of the recommended practices" (p. 198). Components of the middle school concept that are not being implemented completely or at all in middle schools due to organizational structure and/or size include: interdisciplinary teams, advisory programs, looping, heterogeneous grouping, looping, and parental involvement (Peterson, 2001).

In addition to the organizational structure issues associated with the middle school concept, there are other obstacles to full implementation. To start, teachers have to be taught how to think differently about the world of middle level education. A mediocre understanding of the characteristics of the middle school student will not allow an educator to meet each student's needs (Anfara & Schmid, 2007). Furthermore, teachers who have worked so long in isolation may not be sure how to work collaboratively with teachers from differing subject areas (Juvonen et al., 2004). In the looping situation, with the use of interdisciplinary teams, teachers need to be able to work with other educators for the full establishment of the school community.

According to Belfanz et al. (2006), another consideration related to the teacher that results in the lack of success at the middle school level is inconsistency in teaching staff due to high turnover rate or movement within the school district to another grade or building. They strongly recommend reducing the fluctuation in teaching staff. By keeping students with the same teacher for more than a single instructional year, stability can be established for the student.

Beyond changing the thought processes of educators and reducing turnover, school size needs to be addressed and can be when considering the timing of school transitions. Moving to a sixth through eighth grade middle school arrangement rather than remaining in a K-8 grade configuration allows for greater gains in achievement over the three years of middle school as well as creating a smaller school community (Erb, 2006). A three year looping configuration has been found to have significance on student achievement (Lindsay, Irvin, Tanner, & Underdue, 2008; Sterling, 2011).

School size can be addressed within the confines of the school community. Not all obstacles can be controlled or altered by school restructuring. One such obstacle that still needs to be taken into consideration is student socioeconomic status. Studies have shown that students with low socioeconomic status achieve better in smaller schools (Erb, 2006; Okpala, Smith, Jones & Ellis, 2000). If the school is not small, use of school-within-a-school and looping can be used to create the *smallness* of a small school within the large community (Balfanz et al., 2006; P. Freeman, 2007; George & Lounsbury, 2000; NMSA, 2003).

A recent study validates the middle school concept and confirms the issue is a failure to fully, completely, and/or properly implement the components which make the middle school concept effective. McEwin and Greene (2010) reviewed trends in practices designated as part of the middle school concept over time. These practices include interdisciplinary teams, common planning periods, flexible scheduling, focus of curriculum on core subjects, instructional strategies, heterogeneous grouping, advisory programs, and professional preparation and middle level certification. Their study found that the middle school concept and philosophy is still valid; however, there is a failure to properly implement the practices reviewed. This was described as an "arrested development" where the schools fail to move ahead with full implementation of the middle school concept (McEwin & Greene, 2010, p. 60).

Reform in Middle School.

Given the changes in society and the world, improving our current education system is a must, and making education more relevant to the child's needs is essential (Hunt, 2005; Springer, 2009). When considering reform, the driving force should be increasing achievement, not just incorporating a prescribed practice (Morocco, Brigham, & Aguilar, 2006). As indicated previously, the middle school concept is founded on sound theory and the practices all work together to promote the academic, social, emotional and physiological advancement of the young adolescent (NMSA, 2003).

Published in 1999, Cushman's article, "Essential School Structure and Design: Boldest Moves Get the Best Results," held many fundamentals to be considered in current needed education reform and revitalization. She explained that successful school change depends on the school community. Any school reconstruction can look good on paper, but unless the stakeholders (teachers, principals, parents, students) understand, believe in, and embrace the change, it will not work. A good practice cannot just be brought into the school community. The practice needs to be cultivated.

Cushman (1999) provided essential principles and/or non-negotiables to consider for school designs. One essential in school design, directly related to the middle school concept, is that the student needs to be known by the teacher. Practices which support the teacher getting to know the student include: small school size, school-within-a-school, and looping (Cushman, 1999). This concept of knowing the student is the essence of the middle school concept and looping provides a means to truly get to know a student.

The next component of essential school design is having flexible school routines. Another primary component of middle schools is flexible scheduling. Cushman's (1999) suggestions for supporting academics through flexible school routines that apply to the middle school realm included: a year-round calendar, common planning time for teachers, and advisory programs. Looping provides a foundation for the relationship building which is essential to the advisory program.

Important to the middle school concept is including all stakeholders in decisions made that impact the community. Therefore, the next non-negotiable is that the school faculty needs to have the authority to make decisions. Also to support the staff in making appropriate decisions for curriculum delivery and meeting the needs of students, Cushman (1999) promoted collaborative work among the staff supported by common scheduled plan time –another required component of the interdisciplinary team component of the middle school concept. The looping arrangement is implemented best in conjuncture with interdisciplinary teams.

By bringing all stakeholders together to make decisions, the next essential is more easily established. Schools need to continue including school community members that are not at the school every day. This means active inclusion of families and the community-at-large in school activities (Cushman, 1999). Looping incorporates strong communication between the school and family which can lead to efficient inclusion in school activities.

As much as family and school community involvements are a part of the middle school concept, the final non-negotiable component identified by Cushman (1999) is a key to the success of the middle school. The school community needs to be a safe haven; a place where decency and respect are cultivated among all members of the school community. To develop the safe and secure environment of the school, Cushman suggested creating small schools, putting into place advisory programs, and allowing students to provide input to the community. Looping can be used to create relationships which provide middle school students the basis for feeling safe at school.

Keeping the connections between essential school design and the middle school concept in mind, Erb (2009) suggested middle school education has moved from a need for reform to a need for revitalization. Noting there has been a resistance to change in education, resistance to change can no longer be allowed. The world has transformed socially, technologically, and economically. While the world has transformed, the education system has remained stagnant, causing the learning process to become "irrelevant and ineffective" (Erb, 2009, p.4). With the American society living in a global arena now, today's students are not prepared for the future. Erb, therefore, proposed revitalization versus reform at this time.

In order for revitalization to occur, the interactions between four factors must be understood and subsequently addressed. The fundamentals of revitalization include: effects teachers have on learning, impacts of extraneous factors that positively or negatively impact learning and achievement, intrinsic and extrinsic characteristics of the students themselves, and defining necessary subject matter. Erb (2009) stressed that the revitalization of middle school education must be comprehensive and not focus on only one segment of the issue.

The first fundamental of middle school revitalization is the impact teachers have on learning. Successful middle level teachers have an extensive knowledge of content, an array of pedagogical methods, efficient classroom management skills, and the ability to build strong relationships with students (Anfara & Schmid, 2007). Traits of effective middle school teachers are divided into two categories: personal qualities and professional characteristics. Personal qualities of effective middle level educators reflect an individual who is optimistic, enthusiastic, respectful, accepting, and cooperative. The professional characteristics of the effective middle level educator reflect the middle school concept and include, but are not limited to: understanding of the young adolescents' needs, use of differentiated materials and instructional methods, promotion of critical thinking and communication, and encouragement of self-awareness (Anfara & Schmid, 2007). A key to the success of a looping arrangement is a quality teacher who possesses these character traits. If a teacher is able to exude positive character traits while also having a strong professional grasp on content and pedagogical delivery, and if that teacher is placed in a looping arrangement with students, the student's cognitive but also social and emotional needs will be met.

When moving to revitalize the middle school concept, the extraneous factors that impact learning are numerous. Two primary stakeholders, other than the educator, that play significant roles in middle level education are the school administrator and the student's parent or guardian. While factors such as effective teachers and school size impact student learning, quality leadership also impacts student achievement (Anderson, 1998). For school leadership to be effective in promoting change within the school community, the administrator must recognize change is not easy and involves changing the hearts and minds of the school community members (Erb, 2006). Middle level principals must work with staff to help meet students' needs to promote achievement gains for students (Supon, 2008).

In addition to school administrators, parents, guardians, and other family members have a great impact on the success of the student. Despite the trend of parent involvement decreasing as students move out of elementary school, the need for parents to be involved does not decrease. During pre- and early-adolescence, families need to provide social, cultural and emotional supports (DePlanty, Coulter-Kern & Duchane, 2007). "Parental involvement is a better predictor of student success than is family income or educational level" (Reilly, 2008, p. 42). Because of the extended time spent with a student, connections to the family are expected to be established during the looping progression.

When considering revitalization at the middle school level, the most important stakeholder to consider is the student. The other primary stakeholders (teachers, principal, and parents) must consider how the physiological, social and emotional changes the young adolescent endure impacts learning (Lounsbury, 2009). In *This We*

Believe (NMSA, 2003), the importance of addressing the young adolescent's academic, physiological, social, and emotional needs are clearly established. Learning at the middle level needs to be continuous allowing students to develop at their own pace with regards to the divergence in ability to think (Romano & Georgiady, 1997). When a teacher moves to the next grade with students, the student is recognized at the next grade from the previous year. The learning picks up from where it left off the previous year allowing the student to continue learning at the pace the teacher knows needs to be set.

The final aspect of revitalization to be considered is the subject area content. The content presented at the middle level needs to be engaging, challenging, and relevant to the middle level student (NMSA, 2003). The curriculum is to be delivered utilizing methods which are developmentally appropriate for the pre- and early adolescent child (Anfara, 2003). The middle school concept promotes a student-centered and multidisciplinary curriculum that directly relates to the young adolescent (Andrews, 2008). Teacher rotation allows the curriculum delivery from the previous year to be pre-existing knowledge for the teacher and keeps the curriculum delivery consistent for the student.

Whether considered reform or revitalization, the focal points to consider – teaching competency, extraneous factors, student considerations, and content delivery– stretch easily within the scope of the middle school concept. As shown with the theoretical framework and the middle school concept, the instructional delivery method of looping spans the essence of reform. Teachers need to be knowledgeable on multiple levels to successfully move students through an academic loop in middle school. Factors that impact learning, which exist outside the student and/or teachers grasp, need to be considered prior to entering a progressive learning situation. The middle school student can greatly benefit from the long-term benefits of looping which support the academic, social, emotional and physiological changes the young adolescent experiences. And, the curriculum delivery in the looped system allows for more consistency and continuality for covering the content in the developmentally relevant, engaging and student-centered curriculum.

The Looping Concept.

Looping was, by default, the essence of the one-room school house – the same teacher had the same students year after year (Hitz et al., 2007; Lincoln, 1997). Education transformed after the one-room school house and became large entities housing masses of students. Looping was still used in some schools and the United States Department of the Interior, who then oversaw education programming at the federal government level, examined the structure of the looping classroom. In 1913, the Department of the Interior issued a memo which discussed the benefits of looping as a result of implementation in schools at the time (Grant, Johnson, & Richardson,1995 as cited in McCown & Sherman, 2002; Kerr, 2002).

As the middle school concept was developed, educators revitalized the use of looping because looping provided a means to accomplish the goals of the concept (P. Freeman, 2007; George, 2009a; George & Lounsbury, 2000; Juvonen et al., 2004; Lincoln, 1997, 1998a; Little & Little, 2001; McCown & Sherman, 2002; NMSA, 2003; Peterson, 2001; Thompson, Franz, & Miller, 2009; Wilcox & Angelis, 2009). Not all educators called what they were doing *looping*. Multi-year instruction, multi-year teaching, teacher rotation, two-year cycle, persistent grouping, and student-teacher progression were names that represented the same model where the teacher moved on with the group of students from one instructional year to the next (Elliot, 1998; Gaustad, 1998; Grant et al., 1993; Hitz et al., 2007; Kerr, 2005; Lincoln, 2000; McCown & Sherman, 2002; Nichols & Nichols, 2002; Vann, 1997; Yamauchi, 2003).

While the use of the looped classroom moved from a common use to seldom used, the concept of the looped classroom has been a prominent component of education internationally (McCown & Sherman, 2002; Thompson et al., 2009; Wynne &Walburg, 1996). Looping is practiced as a primary tenet of education in countries across Europe such as Italy and Germany (Burke, 1997; Grant et al., 1996; Hegde & Cassidy, 2004; Hitz et al., 2007; Kerr, 2002; Lincoln, 2000). Israel, in the Middle East, employs looping (Grant et al., 1996 and Lincoln, 2000). Further east in Asia, China and Japan utilize looping from elementary through secondary grades (Hegde & Cassidy, 2004; Hitz et al., 2007; Kerr, 2002; Liu, 1997, Nichols & Nichols, 2002).

Specific examples of the international use of looping are described in the literature. Schools in China use looping throughout the course of a student's education to enhance relationships (Kerr, 2002; Liu, 1997; Wynne & Walberg, 1994). Similarly, in Japan, looping begins in the primary grades and continues through the high school level at which point students have the same teacher for a specific content area (Lincoln, 2000; Liu, 1997; Nichols, 2002). Kerr (2002) identified looping in northern Italy within preschool classrooms utilizing three year cycles. A German implementation of looping, which focuses on the creation of a community learning atmosphere, is the Koln-Holweide School. This community of secondary learners begins the subsequent years of the loop with the teacher(s) already knowing who they are (Kerr, 2002). Another frequently referred to program is the Waldorf School of Germany. In a Waldorf School, the teacher remains with the class over a period of four school years (Hitz et al., 2007; Kerr, 2002; Lincoln, 2000). Yamada (2007) stated the core practice of Waldorf schools is looping, which enables stable relationships to develop between teacher and students that are critical to child development.

The importance of a teacher developing a relationship with students and moving on academically to the next school year together was a significant practice around the world. However, schools across the United States were rarely putting the practice to use. During the limited of use of teacher-student progression in the American school system, programs such as the Waldorf School were brought to American soil and implemented on a small scale (Yamada, 2007).

Other looping programs have since sprouted up across the United States. Slowly, these programs have provided information regarding the implementation of looping. One example from the United States presented by Gaustad (1998) and Kerr (2002) is the Cleveland-based Project F.A.S.T. (Families are Students and Teachers). Project F.A.S.T. utilizes a three-year cycle which runs from kindergarten through second grade. Another three-year cycle program, which loops 6th, 7th and 8th grades, is the Delta Project of northern Georgia (Kerr, 2002). The Delta Project was initiated by teachers to make the middle grades a more positive experience for students (Pate, Mizelle, Hart, Jordan, Matthews, Matthews, Scott, & Brantly, 1993). In the Midwest, Burke (1996) noted the use of multi-year instruction in District 34 in Antioch, Illinois where teachers volunteered to participate in the practice. Burke also recognized the looping pilot program from Orchard Lake Middle School in West Bloomfield, Minnesota where students were given the choice to participate in a looped learning environment.

New England produced two independent pilot programs for middle school level looping, the first program was established in the late 1980s and the other in the late 1990s. In the late 1980s, the Attleboro School System in Massachusetts used looping in a two-year cycle beginning in first and running through sixth grades; due to its success in increasing student achievement, the program continued into the seventh and eighth grades. Teachers at the Tolland Middle School of Connecticut became intrigued by the concept of looping, performed research, sought approval by the school board and began a looping pilot program during the 1996-1997 school year (Kerr, 2002; Lincoln, 1997, 1998a, 1998b, & 2000). Several studies were conducted with regards to the Tolland program to determine success of looping. Lincoln (2000), principal of Tolland Middle School, reported increases in academic competence, social skills, self-efficacy, and attitude toward school over non-looped peers. Peterson (2001) conducted a study to ascertain the components of successful middle schools and found that fifteen percent of the 50 schools across 10 states he interviewed practiced looping.

Some middle schools in the United States are implementing looping and achieving student success with reportable gains. Looping is closely linked theoretically and conceptually to the middle school concept. Knowing there are achievement gains to be made and the process is theoretically sound, some researchers wonder why more American middle schools do not implement looping (Elliot & Cap, 2008; Fenter, 2009).

The question then becomes: What prevents schools from using a theoretically sound, achievement-producing instructional delivery mechanism in the middle school? What is necessary for implementation of looping in a middle school? Is it financial? Is it due to extensive training necessary for teachers to provide a successful looping experience? Does it require extensive planning?

The primary agent for implementation of programming in any organization is the administrator. The bottom line of program implementation, from an administrative standpoint, is how much is this going to cost? Looping is an easy process to implement because it does not cost much in terms of overall finances (Gaustad, 1998; Grant et al., 1996; Hitz et. al., 2007; Wynne & Walburg, 1994). Looping does not require resources beyond the standard needs of the classroom (Gaustad, 1998; Grant et al., 1996). Looping is much less a financial investment as it is a human capital investment (Kerr, 2002).

However, looping proponents caution against looping being instituted through a top-down mandate, and advocate instead for a school level or even teacher initiated move to the practice. When teachers initiate the change, looping has the primary adult stakeholder already on board for proper implementation (George & Lounsbury, 2000; Kerr, 2002; Little & Dacus, 1999; Little & Little, 2001). As teachers choose to participate, school administrators need to provide sufficient support for successful implementation (George & Lounsbury, 2000; Kerr, 2002; Little & Dacus, 1999; McCown & Sherman, 2002).

A phrase to be kept in mind is look before you loop. Prior to starting a looping pilot program (George & Lounsbury, 2000), research should be conducted to establish knowledge of the advantages and drawbacks inherent to looping (Grant et al. 1996; McCown & Sherman, 2002). After an understanding of all that is involved with looping is obtained, administrators and teachers need to make the long-term commitment to build essential relationships with students (Grant et al., 1996; George & Lounsbury, 2000;

Kerr, 2002; Little & Little, 2001; McCown & Sherman, 2002). The program must then bring all stakeholders into the development phase of implementation (McCown & Sherman, 2002). This includes the parents who need to have presented to them the same advantages and possible pitfalls inherent to looping (George & Lounsbury, 2000; Grant et al., 1996; Kerr, 2002; Little & Little, 2001; McCown & Sherman, 2002). In addition to teachers being given a choice to participate in a loop, so too must students and parents be allowed to choose whether looping is appropriate for them (George & Lounsbury, 2000; Kerr, 2002; McCown & Sherman, 2002).

A goal of the looping program should be adhering to the middle school concept (Kerr, 2002). In order to accomplish that goal, components from the middle school concept should be incorporated into the looping structure for implementation. While Grant et al. (1996) indicated extensive training is not necessary to begin a loop, middle school teachers need to be experienced pedagogically and extremely knowledgeable of the teaching standards, curriculum, and use of assessment data (Kerr, 2002). Availability of quality middle school teachers is a critical facet to the success of looping in the middle grades (George & Lounsbury, 2000; Kerr, 2002). Also, looping works best when connected to a team teaching approach (Little & Little, 2001). Team teaching brings together quality middle school teachers to further insure that the curriculum and appropriate instructional delivery methods are utilized in all content areas, which is another essential component of the middle school concept (George & Lounsbury, 2000; Grant et al., 1993; Kerr, 2002).

A final focal point when implementing a looping scheme to middle school is to build into the program design a means to monitor all aspects of implementation and continued use (McCown & Sherman, 2002). Prior to starting to loop, George and Lounsbury (2000) recommended establishing evaluation and assessment measures to determine the success of looping and achievement gains by students over the course of the loop. Additional monitoring needs to be in place to identify potential problems that may arise between the stakeholders so intervention can occur and the issues can be addressed quickly (Little & Little, 2001).

As part of implementation, advantages and disadvantages of looping need to be brought to light. A review of the literature on looping examines a plethora of benefits to the use of persistent grouping, teacher rotation, student-teacher progression. When Thompson et al. (2009) conducted a research summary on looping, the benefits were categorized into three broad themes: time, relationships, and student support and engagement. While seemingly three independent themes, with respect to looping, there are overlaps observed between the themes.

In the benefit area of time, looping proponents believe the loop buys time for both the educator and the student. The increased time spent together allows for familiarity on multiple levels that carries over to the second and subsequent years of the loop by increasing instructional time (Burke, 1996; Jordan, 2000; Lincoln, 1997 & 1998a; Wilcox & Angelis, 2009). This is a result of looping: reduced need for teachers to start over with students at the beginning of subsequent years in the loop (Crosby, 1998; Hanson, 1995; Hitz et al., 2007; Lincoln, 1997 & 1998a ; Yamauchi, 2003). Essentially, teachers and students pick up from where they left off the previous year. Academic and behavioral expectations are pre-established and need only be reviewed. Some researchers noted the use of summer projects to continue learning from one school year to the next (Burke, 1997; Crosby, 1998; Hitz et al., 2007; Lincoln, 1997). Additionally, by reducing the amount of start-up time needed, teachers have more time for standardized test preparation (Hitz et al., 2007).

From the broad theme of time to that of relationships, it is important to note that the reason there are essential relationships created in the looping situation is because of the extended time teachers and students spend together. Remember, in addition to addressing the academic and physiological needs of young adolescents, the middle school concept fundamentally seeks to develop the young adolescent socially and emotionally. Looping provides an essential component towards this development due to the relationships built between student and teacher over the course of the looping arrangement (Anderson, 1998; Burke, 1996; Coash & Watkins, 2005; Fenter, 2009; P. Freeman, 2007; Gaustad, 1998; George & Lounsbury, 2000; Grant et al., 1996; Hegde & Cassidy, 2004; Nichols, 2002; Voyer, 2009; Yamada, 2007). By increasing relationships, the connections between teacher and student, as well as teacher and parent, are enhanced to a positive level of interaction (Gaustad, 1998; Hitz et al., 2007; Kerr, 2002; Lincoln, 1997).

Building strong relationships among teacher, student, and parent creates a sense of community that is unique to the looping arrangement (Balfanz et al., 2006; Burke, 1997; Fenter, 2009; Grant et al., 1996; Hitz et al., 2007; LAB, 1997; McCown & Sherman, 2002, Nichols, 2002; Peterson, 2001). The community created is further established with a noticed increase in parent involvement and communication with the school (Fenter, 2009; George, 2009a; Hegde & Cassidy, 2004; Hitz et al., 2007; Lincoln, 1997, 1998a, 1998b, & 2000; McCown & Sherman, 2002). The extended relationships and dialogue between home and school have also been noted to decrease discipline problems in the academic setting (Forsten et al., 1997; Gaustad, 1998; Jacobsen, 1997b; Lincoln, 2000; McCown & Sherman, 2002; Nichols, 2002).

Another benefit of spending more than one year with a student is that the teacher can obtain a better understanding of the student's learning style and educational needs (Burke, 1996; Crosby, 1998; Elliot, 1998; Gaustad, 1998; Lincoln, 1998; McCown & Sherman, 2002; Nichols, 2002). This idea is tied closely to the middle school concept of meeting the needs of the pre- and early- adolescent child. From the teacher's perspective, being with the child allows for a relationship that is secure and stable for the child (Hegde & Cassidy, 2004). This increased knowledge of the student's needs and abilities should allow for increased academic achievement (George, 2009a; Lincoln, 1997 & 2000; Liu, 1997).

In order to shift from relationships to the final broad theme of benefits, Thompson et al. (2009) identified the overlaps of benefits between relationships and student support and engagement. Due to the relationships of the looping arrangement, trust is built between the teacher and the student which leads to the student believing the teacher is working to help the student achieve (Chirichello & Chirichello, 2001; Crosby, 1998; Hegde & Cassidy, 2004; Hitz et al., 2007; Liu, 1997). Because the student has developed a trust and comfort level with the teacher, school-related anxiety can be reduced, which allows the young adolescent to become a better learner (Burke, 1997; Fenter, 2009; Hegde & Cassidy, 2004; Hitz et al., 2007; Lacinda-Gifford, 2001; McCown & Sherman, 2002). Another student supportive result of the looping-established relationship is an increase in self-esteem for the middle school level student (Burke, 1997; Grant et al., 1996; Hegde & Cassidy, 2004).

Looping also provides stability in the adult figure for the pre- and early adolescent in the school setting (Lincoln, 1997, 1998a & 2000; Little & Little, 2001; Nichols, 2002). For many of today's students, the teacher may be the only stable adult figure in their lives (Hitz et al., 2007). When a student has a consistent adult in his/her life, the emotional needs of the student are more likely to be met (Lincoln, 1997; McCown & Sherman, 2002). The looping arrangement provides consistency beyond the stability of a regular adult presence. Consistency also includes style of teaching and instruction, communication, and behavioral and academic expectations which leads to increased engagement by the student (Burke, 1996; Crosby, 1998; Hitz et al., 2007; McCown & Sherman, 2002; Nichols & Nichols, 2002).

The consistency of the presence of the same educator between years of the loop leads to another supporting factor for the student. The looping teacher is able to provide the student with continuity of the curriculum on two levels. First, when the educator is the same in subsequent years of learning, there is no ambiguity held by that educator as to what was taught from a content perspective the year before. Second, the educator has background knowledge of each student's academic, social, emotional and physiological development that enables the educator to more fully meet the student's overall needs (Crosby, 1998; Forsten et al., 1997; Friedlaender, 2009; Hegde & Cassidy, 2004; Hitz et al., 2007; Lincoln, 1998a & 1998b; McCown & Sherman, 2002).

Finally, perhaps the most significant benefit of the student support and engagement theme is increased student achievement. Many scholars report that if implemented correctly and utilized to looping's full potential, looping has the ability to increase student achievement (Chiricello & Chiricello, 2001; Lawton, 1996; Nichols, 2002; Yamauchi, 2003). Numerous programs have shown achievement gains connected to the use of looping. In a qualitative study, Chirichello & Chirichello (2001) shared that one student who began first grade as a disengaged learner who did not assess well on mathematical or reading prompts, was able to achieve total standardized test scores approaching the 90th percentile after two years of looping. The F.A.S.T. looping program in East Cleveland, Ohio has reportedly shown increases in achievement on math and reading standardized assessments (Bracey, 1999; Burke, 1997; Gaustad, 1998). The looping program of Tolland Middle School, according to Principal Lincoln (1998a), showed increased achievement in writing. Lincoln (2000) reported the state level assessment scores for the Tolland Middle School in the areas of math, writing, and reading from a period of 1994 through 2000. The first team looped at the school in the fall of 1996; therefore, the results show a longitudinal result of looping. The greatest overall increase was seen in math scores at 77 percent compared to the pre-looping scores of 66 percent of the state goal attainment.

More recently, studies have been showing support for academic achievement related to the use of looping. A study that was based in a southeastern United States elementary school showed, after a three year loop, that students who looped outperformed their non-looped peers on all components of the Criterion Reference Competency Test (CRTC) (Lindsay, Irving, Tanner, & Underdue, 2008). A case study done in the Oakland Unified School District regarding the use of a program called ASCEND (A School Cultivating Excellence, Nurturing Diversity) reported that students performed better than had been expected on California Standards Tests (CST)

(Friedlaender, 2009). A study conducted in California by Sterling (2011) at the fourth through sixth grade level began with a baseline from third grade showed the control group achieved at a slightly higher rate than the looping group. At the end of the three year loop, data showed the looped group scored significantly higher in achievement in both math and reading on the CST.

Anytime one presents the positives of an issue, the negatives need to be equally addressed. Looping, too, has potential drawbacks. The primary concern with looping is the possibility that a student would be placed with an ineffective teacher (Gaustad, 1998; Hitz et al., 2007; Lawton, 1996; Lincoln, 1997 & 2000; Nichols, 2002; Vann, 199). The presence of a personality conflict between teacher and student or teacher and parent are other concerns that are often voiced (Forsten et al., 1997; Grant et al., 1996; Hegde & Cassidy, 2004; Vann, 1997). Another drawback may be adding students *mid-loop* or at some point after the second year of progression has begun (Chirichello & Chirichello, 2001; Gaustad, 1998; Hanson, 1995; Hitz et al., 2007). From the researcher's perspective, the greatest concern for looping is that if any mishap occurs, it will be blamed on looping (McCown & Sherman, 2002).

When each pitfall of looping is thought about carefully, it is realized that many of these pitfalls are potentially present in schools whether looping occurs or not. Because of the relationship and community-based nature of looping, many of these concerns can be inherently addressed. One example of how the potential drawbacks of looping can be addressed is to allow participation to be voluntary which ensures the participants, teachers or students, are willing to make the commitment to the extended time with the same students and/or teacher (Vann, 1997). Further, Yamada (2007) goes as far to say that, “the benefits of looping outweigh the concerns” (p. 20).

The use of looping spans the globe, the implementation can be easily and affordably completed, the benefits are numerous and the drawbacks limited, but what else should be considered before jumping into the loop? Looping proponents want middle level educators to keep in mind the purpose of learning and experiences that are the foundations of the middle school level when considering persistent grouping. The point of looping at the middle level is to provide stability, continuity, and relationships that increase student growth and development cognitively, socially, and emotionally (Little & Little, 2001; McCown & Sherman, 2002). Allow all stakeholders to have a choice about whether or not to join the looping arrangement (Gaustad, 1998; George & Lounsbury, 2000; Hume, 2007; Jacobsen, 1997b; Kerr, 2002; Little & Dacus, 1999; Little & Little, 2001; McCown & Sherman, 2002; Vann, 1997). Furthermore, remember, there are no guarantees. Looping provides a substantial framework along with the middle school concept to allow for improvement (George & Lounsbury, 2000). Looping may increase achievement, but be sure looping is put into practice *for the right reasons* (Forsten et al., 1997).

Research on Looping.

With a resurging interest in the practice of looping, researchers are conducting studies to determine the impact looping has on academic achievement. While studies of the past were primarily qualitative in nature, many of the more recent studies are quantitative or contain quantitative components. All of the recent quantitative studies examining student achievement, reviewed here, employed the use of standardized test results for analysis. Many of these analyses were *ex post facto* in nature. Several studies conducted a version of the *t*-test, while other studies utilized regression analysis to determine the significance of looping on student academic achievement. Content areas examined were typically reading, language arts and mathematics. Many studies were conducted at the elementary level, but several were middle school level looping situations. Results ranged dramatically: statistically significant, not statistically significant but showed improvement, statistically significance in one content area but not another, and not statistically significant.

The current study focused on the content area of science; therefore, finding a recent study that examined student achievement on standardized test scores in science was highly relevant. The following study examined student performance in science on state level standardized tests (Feighery, 2012). Data from the Louisiana state assessments (2009, 2010, and 2011) and a retention of knowledge assessment developed by using the Louisiana Department of Education's EAGLE (Enhanced Assessment of Grade-Level Expectations) System were used to determine differences between students who had looped in science from sixth through eighth grades and those who had not looped. The students were all from the same school district in Louisiana. By using students from the same school district, the demographics of the treatment and control groups were similar (Feighery, 2012).

Using a *t*-test to examine the Louisiana state assessment data, the study found the looping and non-looping students to be significantly similar at the end of 2009, the first year of the study. At the end of the second year, 2010, the two groups were significantly different, with the looping group showing higher science achievement than the non-looping group. This achievement difference was promising to support the instructional delivery method of looping. At the end of 2011, the third year of the loop, the science achievement of the looping and non-looping students were again significantly similar. A reconfiguration of the schools within the school district occurred between the second and third years of the looping cycle, combining two rival middle schools into one. Feighery (2012) surmised this had an impact on students during the final year of the loop.

After examining the state assessment data, Feighery (2012) had students at the beginning and end of the first school year after the looping (ninth grade) participate in an assessment to ascertain retention of science content knowledge. This assessment was created using the EAGLE System to examine state Grade-Level Expectations for content knowledge. Again using a *t*-test, the results of this content retention assessment did not show looping to have any significant positive impact on achievement. Interestingly, the content retention assessment for these ninth grade students showed a decrease in content retention from the beginning of the school year to the end of the school year in the content area that was studied in ninth grade. Despite this overall decrease in retention, the looped students did retain more science content than their non-looped peers, just not at a statistically significant level (Feighery, 2012). In this study, looping did not seem to improve overall content retention; however, science knowledge retention improved in the looping group.

The next three studies found looping to also not be statistically significant, but the looping cohorts showed more improvement or achieved better than the non-looping peers. In 2010, an *ex post facto* study utilized results from the norm-referenced New Jersey Assessment of Skills and Knowledge (NJASK) assessments for middle school students from the same middle school where the looping consisted of a two year loop from seventh through eighth grades (Nessler, 2010). The experimental group, composed of the students who had the same teachers for Literacy and Mathematics over the two year loop, contained 73 of the starting seventh graders in the school. The control group (the non-looping group) was composed of 285 students of the seventh grade class. Students were not included in the study if they were not in attendance for the full time frame of the study (Nessler, 2010).

A *t*-test for independent measures was utilized for data analysis. A baseline to determine any differences between the control and treatment groups was conducted and no significant difference was found in either Literacy or Mathematics prior to the implementation of looping; therefore the groups were considered statistically equivalent. After the two year loop, analysis of the NJASK data showed the means of the looping group's Literacy and Mathematics scores were slightly higher. However, no statistical significance was found between the means for either Literacy or Mathematics on the NJASK standardized test for these New Jersey middle school students (Nessler, 2010).

A study in Pennsylvania was more longitudinal in nature –spanning from 1999 through 2005 (Snoke, 2007). Students across two school districts with similar demographics were followed from third through eighth grades. The looping cycle of two years occurred from third to fourth grades and included 60 students across the two districts. Fifty-six students were used as the control group and attended traditional classrooms in the two school districts. Three standardized assessments scores were used for the study from the content areas of reading and mathematics: the Stanford Achievement Test, Ninth Edition (SAT 9), TerraNova Standard Achievement test, and the Pennsylvania System of School Assessment (PSSA). The assessment data was selected based upon the grade level of availability for results; that is SAT 9 and TerraNova results for the third grade year, depending upon school district, and the PSSA results for the fifth and eighth grade years (Snoke, 2007).

The study used a causal-comparative method to examine the students who were in looping and non-looping groups with regards to academic progress in reading and mathematics as associated with gender and socioeconomic status. It also explored impacts on retention and special education placement rates. To analyze the data for these areas, regression analysis and an independent *t*-test were used to compare the third, fifth, and eighth grade assessment results. After analysis, no statistically significant conclusions could be made regarding academic achievement or progress in reading or mathematics by gender or socioeconomic status. Also, looping was not found to have a statistically significant impact on retention rate or special education placement for these Pennsylvania students. Despite there being no statistically significant results, it was noted that the looping students did "outscore their counterparts in traditional classes" (Snoke, 2007, p 86).

In Mississippi, Fuller (2006) examined middle school student achievement on the criterion-referenced Mississippi Curriculum Test (MCT). The experimental group for this study consisted of 69 students who looped from seventh through eighth grades with the same core of academic teachers. The control group of 142 students was taught by different core academic teachers in seventh and eighth grades. All students came from the same middle school and a baseline for group equality was established using sixth grade MCT data. Data at the end of the seventh grade year was also examined to establish relative equality in teaching by showing no statistical difference between groups. In addition to using a *t*-test to examine the MCT Reading, Language, and Mathematics sections for differences between looping and non-looping groups, the looping and non-looping achievement was disaggregated by gender and socioeconomic status (Fuller, 20006).

In all areas of analysis except for one, the looping students had greater improvement from seventh to eighth grades as compared to the traditionally placed counterparts (Fuller, 20006). These improvements were found in reading, language and mathematics overall, by gender and by socioeconomic status. The exception was that looping students in the poverty category had scores that were lower in the content area of reading compared to their non-looping peers. While the studies showed improvements in all subject areas, statistical significance was not as prominent in the results. At the end of the looping year, the seventh to eighth grade MCT results were statistically significant for looping in the content area of language ($p = 0.0003$), but there were not statistically significant p-values for reading ($p = 0.4419$) or mathematics ($p = 0.8634$) for the same time frame (Fuller, 2006).

Caauwe (2010) conducted another study which produced mixed results with regards to the impact of looping on achievement at the elementary level. The persistent grouping occurred between fifth and sixth grades and the results of the Stanford Achievement Test Series 10 (SAT10) for Reading and Mathematics were used in this mixed results study. Fifth grade scores were compared with sixth grade scores to determine academic gains by the looping and non-looping students. With regards to reading achievement, no statistically significant difference was found between looping and non-looping students. However, there was a statistically significant difference found in Math achievement for the looping students (Caauwe, 2010).

In contrast to the previously discussed studies, the following studies showed statistical significance in academic gains for looped students. The first of these studies used an *ex post facto* approach to evaluate the impacts of looping on middle school students in a New Jersey self-contained special education classroom. Orazi (2012) examined Kaufman Test of Educational Achievement, Second Edition, scores for Reading Comprehension and Mathematics for fifteen students involved in a two year loop. The 15 students were organized into two groups for analysis: those having minor behavior infractions and those with major behavior infractions, based upon the number of behavioral referrals each student received.

The focus of Orazi's (2012) study was three-fold: to see if these special education students made significant academic achievement gains after two years of looping, if students with fewer behavior incidents had greater academic gains, and if looping reduced behavioral issues. Using a 2x2 mixed ANOVA, the researcher evaluated academic achievement for each year of the loop, for both reading comprehension and mathematics as well as behavior. Orazi found there was a significant academic gain in reading comprehension for these 15 students at the end of the second year of the loop. Students who made significant gains in mathematics at the end of the two year loop were those in the minor behavior infractions group. Additionally, no change in behavior was recorded as students did not move between behavior groups by the end of the second year of looping. Overall, this study showed positive implications with regards to academic achievement for special education middle school students who are looped, though no benefit could be seen for decreasing negative student behavior (Orazi, 2012).

Sterling (2011) conducted a study that utilized a *t*-test for independent means at the elementary level by examining mathematics and language arts academic performance on the California State Achievement Tests (CST). The students studied were within the same school and this allowed for similar demographics to be in place. The persistent learning group started in the fourth grade and continued through the sixth grade. The researcher established a baseline for the difference between the groups using third grade data for both mathematics and language arts. Sterling found the non-looping group to score higher on both mathematics and language arts at the start of the looping time frame.

Sterling (2011) conducted analysis to determine the difference between the looping and non-looping students' achievement based on the CST data from the fifth grade year, which was the second year of the looping cycle. In the area of mathematics achievement on the CST, the looping group's achievement was statistically higher than the non-looping group. In the area of language arts, the difference between the means of the groups was also statistically significant with the looping group outperforming the non-looping. Sterling further disaggregated the data in the following areas: gender, ethnicity, and English language learners. In each of these subcategories, Sterling found looping to have a statistically significant increase in academic achievement over the non-looping group.

In addition to the increase in quantitative studies, there have been recent qualitative studies examining the impacts of looping. The findings of these qualitative studies, as those in the past, provide affirmative support for the utilization of the instructional delivery method of looping. Table 1, Summary of Recent Qualitative Research Studies on Looping, provides a brief synopsis of four of the recent qualitative studies on looping from elementary and middle school level loop configurations.

Table 1

Summary of Recent Qualitative Research Studies on Looping

Author, Year	Focus	Grade Level of Loop	Study Type	Data for Analysis	Results/ Findings
Brown, 2011	Looping experiences for students with learning disabilities	Third through Fourth Grades	Phenomen-ological Case Study	Interview; Questionnaire; Examination of Student Artifices; Direct Observation	Looping improved social and emotional skills, but did not lead to significant academic or speech improvements.
Blair, 2008	Looping impacts on academic success	Pre-K through Fifth Grades	Case Study	Interview	There are consistent characteristics between looping and improving academic achievement.
LaVerne, 2006	Looping perceptions versus academic performance	Seventh through Eighth Grades	Case Study	Interview, Survey, Document Analysis	Looping is positively perceived by parents, teachers and students; however, student performance data does not show academic advancement.
Gilliam, 2005	Looping suitability for middle school	Sixth through Eighth Grades	Case Study	Questionnaire, Interview, Direct Observation, TerraNova assessment data	Looping tends to benefit middle school students socially, behaviorally, and environmentally.

Science & Standardized Tests.

The theoretical framework of the middle school concept and looping are coherently linked to the content area of science. Students learn by making connections between background knowledge and new concepts (Vygotsky's theory) through discovery about the facts and how the knowledge relates to them (Bruner's theory). This constructivist thinking molds directly to the world of science education. The key to understanding and developing science concepts is prior knowledge (Dougherty, 1997; National Research Council, 2006).

In addition to student-centered curriculum, another component to student success in science is student attitude toward the content. If a student has a good attitude toward science the student will have greater achievement (George & Kaplan, 1998; Odom, Stoddard, & LaNasa, 2007). A new interest in the content area needs to be sparked within students to change the attitude held about science. A contributing factor to student attitude which impacts success in science, according to George & Kaplan (1998), is parental influence on science attitude. Since looping increases the likelihood of parental involvement and communication (Fenter, 2009; Grant et al., 1996; Hegde & Cassidy, 2004; Hitz et al., 2007; Kerr, 2002; McCown & Sherman, 2002), parents are more likely to develop a positive regard for science and to share this with their student.

Other obstacles that prevent advancements in student achievement in science include lack of curricular consistency, lack of means to appropriately disseminate the curriculum, a young teaching population or high turnover rate, and a lack of professional development to ensure proper science instructional strategies are being used with middle level students (Ruby, 2006). Resources to deliver the curriculum in a developmentally appropriate way need to be secured. Furthermore, teachers need to be given professional development opportunities and means for networking with other professionals (Capp, 2009; Ruby, 2006). Looping provides ample opportunity for teachers to provide consistent curriculum flow.

When teachers have the necessary tools for instruction, they can better prepare students to achieve in the content area of science. To make gains on standardized assessments, teachers need to be able to incorporate test taking strategies within the science curriculum (Supon, 2008; Turner, 2009). In addition to reviewing test taking strategies, teachers also need to provide students with motivation that will build confidence in science and in taking standardized tests (Supon, 2008; Turner, 2009). Another aspect of student success on science assessments is vocabulary and context use. Science exposes students to many new words each year and the understanding of those key words is vastly important to reading and understanding test questions (Boaler, 2003; Visone, 2009). With the use of teacher rotation, more time is available for the teacher to incorporate test taking skills in instruction.

Gaps in the Research

Much of the research that exists regarding looping is qualitative in nature and/or from the time of re-institution of looping in the 1990s (Chirichello & Chirichello, 2001; M. Freeman, 2000; Hegde & Cassidy, 2004; Jenkins, 2009; Kerr, 2002; Lincoln, 2000; Nichols, 2002; Nichols & Nichols, 2002; Schaefer, Khoury, & Ginsburg-Black, 2003; Sherman, Fitz, Hofmann, 2002). However, there has been a recent renewal of research in looping, with many of the studies being quantitative or a blend of quantitative and qualitative (Balfanz et al., 2006; Baran, 2008; Friedlaender, 2009; Gregory, 2009;

Rodriquez & Arenz, 2007; Rotering, 2009; Snoke, 2007; Voyer, 2009). What is problematic is that most research explores the use of looping in the elementary level of education and many quantitative studies have results that are not significant or are inconclusive (Feighery, 2012; Fuller, 2006; Caauwe, 2010; Nessler, 2010; Schaefer et al., 2003; Snoke, 2007). Also missing from the research is how looping impacts achievement beyond mathematics and reading.

Past researchers have made recommendations as to what future research should attempt to accomplish. For example, research is needed to investigate overall achievement gains made that may be related to the practice of looping (Rodriguez & Arenz, 2007; Snoke, 2007). Gregory (2009) suggested research on demographically similar students comparing students exposed to looping to those not, the impact of teacher turnover on the looping experience, impact of student and teacher choice to participate in looping, and the transition to high school by looping students. Expanding the size and making studies longitudinal in scope was a recommendation by other researchers (Nichols, 2002; Snoke, 2007; Sterling, 2011). When conducting quantitative studies on looping, Nichols (2002) asserted that it would be best to make attempts to control for confounding variables such as prior achievement and economic class. Cognitive ability and socioeconomic status were supported by other researchers in the literature as relevant confounding variables (Erb, 2006; Marchant, Paulson, & Shunk, 2006; Okpala et al., 2000; O'Reilly and McNamara, 2007; Visone, 2009).

Using reading achievement as a means to account for cognitive ability in connection with science is appropriate due to findings from a study conducted by O'Reilly and McNamara (2007). They examined reading ability, reading skill and reading strategy use on content-based achievement specifically with respect to science knowledge. If a student has poor content knowledge in science, a high reading ability will make considerable differences on the achievement the student posts on standardized assessments. Reading achievement therefore would be a good variable to account for with respect to content achievement (Visone, 2009).

In addition to reading achievement, socioeconomic status was found to be a significant variable that should to be accounted for in quantitative studies. A component of middle school success has been found to be socioeconomic status (Erb, 2006). The percentage of students receiving the free and reduced lunch program has been negatively correlated with mathematics and reading achievement (Okpala et al., 2000). Not only is socioeconomic status identified as highly relevant to academic achievement, it is a factor outside the control of educational policy. Because of the diversity in demographics across the nation, controlling for socioeconomic status should allow for a comparison to be made with regards to this demographic (Marchant et al., 2006).

Summary

From the theoretical framework established to support the middle school concept to the development of the middle school concept, the basis for the use of looping at the middle school level is supported. Along with the middle school concept, looping is fashioned to develop the middle school student cognitively, socially, emotionally, and physiologically across the landscape of adolescence on the journey to adulthood. It is up to administrators and teachers at the middle level to acknowledge the deficits in their respective middle school communities and to work to fully implement the middle school concept. Upon complete implementation of the middle school concept, the full possibilities for success can come to the middle school student. Looping is a cost efficient instructional delivery method with which educators can ensure the middle school student concept is being fully implemented. The use of looping easily connects to the delivery of science curriculum. Looping provides background knowledge to the teacher of not only the student, but also the content previously presented to the student. Looping also allows more efficient use of time, allowing teachers to build in methods to assist students in reaching higher academic achievement on assessments.

CHAPTER THREE: METHODOLOGY

Introduction

This study examined the Pennsylvania System of School Assessment (PSSA) scores for science at the eighth grade level for the year 2010. School administrators voluntarily responded to a questionnaire mailed in March 2011 to provide information on the practice of looping with the 2010 eighth grade class in the school. Schools were then identified as looping and non-looping schools from the questionnaire returns. An independent *t*-test was to see if there is a significant difference between the means of looping and non-looping schools with respect to achievement on science assessment scores.

Design

This study utilized a causal-comparative design. A control group and a treatment group were used to examine whether the control group (where no looping occurred) differed from the treatment group (where looping did occur) on science achievement. The method for making a conclusion for this study was to examine existing data to compare groups within the data set. Ary, Jacobs, Razavieh, & Sorensen (2006) consider research which will analyze the data comparing groups "after the fact" as *ex post facto*. Due to its *ex post facto* nature, the study was not able to control for extraneous or confounding variables.

The issues of internal validity for this study were therefore associated with selection. Because the groups are truly pre-existing and could not be randomized, the researcher was limited to the voluntary responses of school administrators for the study sample.

After conducting a pilot (outlined in the Instrumentation section of this chapter), a questionnaire was sent to all schools identified in the Pennsylvania Department of Education (PDE) database as housing students in the eighth grade. The goal was to allow all schools in the Commonwealth of Pennsylvania an equal opportunity for inclusion in the study. Respondents indicated if looping did or did not occur at any time in the previous three years for the 2010 eighth grade class. Respondent schools who indicated that looping occurred in at least the subject of science (other subjects could be looped in addition) were placed in the prospective treatment group. The remaining schools that responded to the questionnaire were then considered for the prospective comparison group.

Subjects and Setting

Fourth, eighth, and eleventh grade students in public schools across the Commonwealth of Pennsylvania take a one hour state science assessment in the spring of the school year. Only the eighth grade PSSA Science assessment scores from the 2010 exam were analyzed for this study. These school level scores are comprised of statistically compiled test results which reflect the achievement of all the eighth grade students that completed the Science PSSA during the testing period. All public school students take the PSSA unless excused for religious reasons by a parent. It was not necessary to examine individual student scores as the goal was to look at impacts on achievement by factors not directly controlled by the student. Looping is a school level variable, therefore the school’s achievement was examined. Schools were placed in the comparison and treatment groups based upon the presence or lack of looping, the independent variable.

In order to compare school achievement across the state, individual student PSSA scores are placed into one of four ranges. These ranges are determined based upon cut scores of individual student test scores as determined by the Department of Education and labeled as follows: advanced, proficient, basic, and below basic. Individual scores are examined cumulatively to determine if a school has successfully met the standards for a particular grade. Determination of *meeting the standards* is assessed by examining the total number of individual student scores that fall into the advanced and proficient ranges (PDE, 2011). Basic and below basic cumulative scores are also provided on the PDE data report.

The students in the advanced and proficient ranges are deemed as satisfactorily meeting the standards while those categorized as basic and below basic are less than satisfactory. A school's Adequate Yearly Progress (AYP) is based upon the combined number of scores that are within the advanced and proficient ranges. Schools currently only need to show AYP gains for the mathematics and reading assessments. The percentages of the advanced and proficient ranges were used as a school's achievement on the Science PSSA in this study. The school level data (percent of advanced and proficient in science and reading and the percent of economically disadvantaged students) were accessed from PDE. This data is available to the public through the PDE website (www.education.state.pa.us).

Instrumentation

In addition to the Science PSSA and Reading PSSA assessment data, information was needed to determine the presence of the independent variable looping. To establish a treatment group, it was necessary to identify which schools had been practicing looping with the eighth grade students from the 2010 assessment year. This information was not available through the PDE website and needed to be ascertained by other methods.

To collect data about the use of looping, a search of the *Mental Measurements Yearbook* (Spies, Plake, Geisinger, & Carlson, 2007) was conducted. Descriptors or key words used to search for an instrument were *looping* and *school administrator*. The tests discovered in the *Mental Measurements Yearbook* did not provide for the school administrator being asked about the use of looping in school. Thus, the information needed to be collected by another process.

The researcher developed a questionnaire to be used that provided an operational definition of looping and a request that the school administrator indicate if the students in the school's eighth grade class were looped over any of the previous three years. The questionnaire also included questions pertaining to the level of participation in the practice of looping with the 2010 eighth grade class. Specifically, questions included: subjects (curriculum) involved, duration of the loop(s) (two or three years), and how many years looping has been in practice within the school district.

Prior to conducting the pilot, the researcher used an expert panel review to ascertain a basis for the probability of consistent returns. The questionnaire was given to several educators to review and comment on the operational definition of looping, the primary prompt of whether looping was practiced for the 2010 eighth grade class, and the follow-up questions regarding looping practice. These educators found the operational definition for looping and the prompts on the questionnaire readable and easily understood establishing a foundation for the reliability of the instrument.

The questionnaire was adjusted to reflect the fourth grade 2010 class and piloted using the PDE Penn*Link listserv using a post directed to elementary principals with regards to use of looping in the fourth grade (see Appendix A). The pilot was conducted with elementary administrators who are representative of the actual study's questionnaire school administrator respondents. The Penn*Link listserv sends electronic announcements to all local education agencies in Pennsylvania. There are more than 900 subscribers to the Penn*Link listserv (PDE, 2012). The purpose of this pilot was two-fold. First, the researcher needed to determine if using Penn*Link would obtain sufficient data for use in the study. Second, respondents were then asked to comment on the comprehension of content and readability of the questionnaire to establish reliability of the questionnaire used in the pilot.

The Penn*Link pilot resulted in only five responses. Of those, one elementary school administrator indicated that looping occurred; the other four reported that looping did not occur. To further establish reliability of the instrument, the pilot respondents were asked to comment on the clarity of the operational definition of looping and directions for the questionnaire. All respondents indicated clarity and ease of understanding. Based upon the low number of responses to the Penn*Link post, the researcher decided to distribute the questionnaire via the United States Postal Service in attempt to increase response rate. Due to the support for the use of the instrument, the researcher readjusted the instrument wording from fourth grade (from the pilot) to reflect eighth grade (for the study). A traditional United States Postal Service mailing distributed the questionnaire in order to obtain necessary information to determine if schools were utilizing the instructional delivery method of looping.

The PDE released the 2010 PSSA Technical Report as provided by Data Recognition Corporation. The report covered all subject areas assessed by the PSSA: reading, mathematics, writing, and science. Some areas contained in the report included an overview of previous PSSA assessments, item development, testing procedure protocol, processing and scoring of results, performance level setting, as well as, reliability and validity (PDE, 2010). As PSSA data was used for analysis in the current study, the reliability and validity of the instrument was pertinent to review.

Reliability of an instrument pertains to the ability of the instrument to "yield consistent results" (Ary et al., 2006, p. 638). The 2010 PSSA Technical Report provided data reflecting the reliability of the 2010 PSSA in the following four areas: reliability coefficients, unconditional and conditional standard errors of measurement, decision consistency, and rater agreement. Findings for reliability for the 2010 PSSA were consistent with PSSA results of the past. Where the range for the Coefficient Alpha is 0.0 to 1.0, the 2010 PSSA Technical Report stated, in the rule of thumb section for interpretation, "reliabilities in the low 0.90s are usually the highest observed and reliabilities in the high 0.80s are very common" (p. 252). The 2010 PSSA reliability values were "excellent, with many in the low 0.90s, for mathematics, reading, and science" (PDE, 2010, p. 258).

Validity is the "extent to which a measure actually taps the underlying concept that it purports to measure" (Ary et al., 2006, p. 640). The 2010 PSSA Technical Report cited content, response processes, the internal structure of the test, the relationships between test scores and other variables, and the consequences of testing (PDE, 2010, p. 277). The 2010 PSSA Technical Report thoroughly provided the evidence necessary in all areas to support the validity of the assessment tool.

Procedures

After obtaining permission to utilize the Penn*Link listserv and with approval from the dissertation committee chair, the researcher completed an Institutional Review Board Research Exemption Request application (see Appendix B). The research to be conducted would not directly involve human subjects beyond questionnaire completion. The questionnaire was included with the application and approval was received (see Appendix B). After piloting the use of Penn*Link, the researcher prepared a United States Postal Service mailing of the eighth grade level questionnaire.

The database of Pennsylvania schools was accessed on the Department of Education website via the *Find an Institution* link. All public schools in the state of Pennsylvania identified as having an eighth grade from the PDE database were included in a mailing sent via the United States Post Office. The questionnaire (see Appendix C) was addressed to all school building administrators and/or guidance counselors who were responsible for eighth grade students. Response was requested by a specified date, two weeks after the mailing occurred. An operational definition of looping was provided and administrators/guidance counselors were asked if looping occurred between sixth and eighth grade in their building/district for eighth grade students who completed the Science PSSA test in the spring of 2010. The operational definition of looping used was as follows: Looping is when the teacher moves from one grade to the next in a curricular subject along with their students for at least two years of teaching and learning (Elliot, 1998; Gaustad, 1998; Hitz, Somers, & Jenlink, 2007; Kerr, 2005; Lincoln, 2000; McCown & Sheman, 2002; Nichols & Nichols, 2002; Vann, 1997; Yamauchi, 2003).

Following the questionnaire prompts, a statement of consent for study inclusion was provided. Contact information for the researcher and Liberty University Dissertation Committee Chair were provided on the questionnaire as well.

The questionnaire (see Appendix C) was mailed through the United States Postal Service to building administrators and/or guidance counselors of all Pennsylvania schools that included an eighth grade class that took the 2010 Science PSSA test. The questionnaire was tri-folded and sent in a business-size envelope with printed mailing and return address labels. Also enclosed with the questionnaire was a tri-folded self-addressed business-size envelope for return of the questionnaire to the researcher (return postage was not applied). Responses from the mailing were received via return mailing through the Unites States Postal Service and logged and stored for data analysis. Schools from which administrators responded that looping had occurred with the 2010 eighth grade students were then identified as a member of the treatment group. Respondents to the questionnaire who indicated that looping did not occur were considered for placement in the comparison group.

Data for analysis were collected from the 2010 PSSA from the PDE website (www.education.state.pa.us). The Science PSSA school level data were collected for use in this study. The Science PSSA advanced and proficient results were used for the independent *t*-test.

To determine the required sample size for this study, a G*Power (version 3.1) analysis was conducted (Faul, Erdfelder, Buchner, & Lang, 2009). A statistical power of 0.80 is considered an acceptable power level sufficient to detect significance in this sample size calculation (Houser, 2007; van Geloven, Dijkgraaf, Tanck, & Reitsma, 2009). The a priori power analyses performed specified multiple linear regression analysis with an alpha level of 0.05, a medium effect size of 0.15, three predictors, and a desired power of 0.80 (Cohen, 1992). The G*Power indicated the minimum of respondents to the study's questionnaire that would be necessary for the analysis was 77.

Data Analysis

After the assignment to comparison and treatment groups (non-looping and looping, respectively), analysis was completed using the PSSA Science achievement school level data to examine the impact of the looping on science achievement. The data used represented the percentage of overall student results for the school that satisfactorily completed the Science PSSA. Satisfactory achievement on the PSSA was identified by scores that fall into the ranges of advanced and proficient. The goal was to test for a significant difference between the means of the two groups.

The data was entered into an Excel spreadsheet where it was organized for analysis. Schools were assigned "L" for looping or treatment group and "N" for non-looping or comparison group. The dependent variable of science achievement was defined as the collective percent of advanced and proficient scores on the PSSA Science assessment. The percent advanced and proficient 2010 PSSA Science achievement was also entered into the spreadsheet.

The data were then transferred to Graph Pad InStat for analysis. The 143 non-looping schools were input to column A and 23 looping schools were input to column B. The test selected to analyze the data was an unpaired, two-tailed *t*-test assuming equal variance. The independent *t*-test was appropriate for this data set because the dependent variable was continuous, the independent variable consisted of two independent groups, and there was no relationship between the groups. Further, two assumption tests were calculated by the Graph Pad InStat program. The first assumption test Graph Pad InStat calculated was to determine homogeneity of variances. The second assumption test Graph Pad InStat calculated was to determine normality of distribution.

The null hypothesis for this study was:

Null Hypothesis.

There will be no significant difference in Science PSSA test scores between students who have experienced the practice of looping and those who have not.

After the independent samples *t*-test was conducted, the Graph Pad InStat program calculated a p-value. The p-value was compared to a 0.05 significance level. If the p-value was less than 0.05, the null hypotheses would be rejected.

CHAPTER FOUR: FINDINGS

Introduction

This quantitative study examined academic achievement in connection to the use of looping in the middle school with regards to the subject area of science. Pennsylvania System of School Assessment (PSSA) data for the 2010 eighth grade science results were obtained from the Pennsylvania Department of Education (PDE). Schools that looped versus schools that did not loop between sixth and eighth grades for the 2009-2010 testing year were determined through the use of a questionnaire. The following data will serve to attempt to answer the Research Question: Does the presence of looping within a school impact achievement on PSSA Science assessments as compared with schools that do not implement the instructional delivery practice of looping?

From the PDE database of schools, 830 schools within the state of Pennsylvania were identified as having an eighth grade class. Questionnaires (see Appendix C) were mailed via the United States Postal Service to those schools. Of the 830 questionnaires sent, a total of 189 were returned to the researcher. Six of these were marked *Return to Sender* by the United States Postal Service. School administrators were asked to indicate the school district and school name as part of questionnaire completion. Two returned questionnaires could not be matched to the master list of schools due to lack of school identification. While the PDE database allowed for selection of schools that contained only eighth grade students, two questionnaires were returned with notification that eighth grade students were not housed in that school building. One school returned the questionnaire declining to participate.

Respondents

As indicated by the G*Power analysis, the minimum number of respondents to the study's questionnaire necessary for analysis was 77. One-hundred seventy eight questionnaires were returned and used for the study's sample. Among the 178 responses, 146 schools indicated that looping was not used in the eighth grade class that took the 2010 Science PSSA. The remaining 32 questionnaires were from schools that indicated looping was used with their 2010 eighth grade students between sixth and eighth grades.

The questionnaire asked schools that practiced looping to provide information about the circumstances under which looping occurred in the school. Schools were asked to identify the school setting, subjects looped, grades within looping cycle, number of years the school had practiced looping and why the school practiced looping. This information provided insight into the practice of looping used in the respondent middle schools.

Table 2

School Setting of Responding Schools Practicing Looping

School Type by Name	Number of Schools
Middle School	12
Schools (K-8)	10
Junior/Senior High School	4
Charter School	4
Intermediate School	1
Alternative Education School	1
Total	32

Within the 32 looping schools that responded, the school setting varied. Twelve schools reported to be middle schools and ten were schools containing kindergarten through eighth grades. The remaining schools that reported looping were four junior/senior high schools, four charter schools, one intermediate school (5-8) and one alternative education school (Table 2).

School administrators of looping schools were asked on the voluntary response questionnaire to provide the overall length of time (in years) the school had been practicing the instructional strategy of looping. Seventeen of the 32 schools responded to the question regarding the length of time that looping had been practiced in the school. The time span looping had been used in these 17 schools ranged between two and 28 years (Table 3).

Table 3

Length of Time Looping was Practiced

Looping was Practiced	Number of Schools
2 Years	1
4 Years	2
5 Years	3
6 Years	2
7 Years	1
8 Years	2
10 Years	2
13 Years	2
+25 Years	1
28 Years	1
No Response	15
Total	32

While seven schools did not respond to the questionnaire prompt asking why the school practiced the instructional delivery method of looping, 25 schools did indicate the basis for looping in the school. Six schools reported looping was practiced by design - to take advantage of the benefits of looping. The remaining 19 schools indicated looping was practiced by default and cited small school size and/or limited staff availability (Table 4).

Table 4

Reason for Looping as Reported by All Schools that Reported Looping

Reason for Looping	Number of Schools
By Design	6
By Default	19
No Response	7
Total	32

The questionnaire also requested building administrators to report on the grades and subjects in which looping was practiced. Schools that looped practiced looping in a myriad of subject combinations and grade configurations. The questionnaire asked school administrators to indicate which grades students were looped over from sixth through eighth grades (Table 5).

Table 5

Grade Configurations of Looping Cycles Used by Looping Schools

Grade Configuration	Number of Schools Using the Configuration
Sixth & Seventh	1
Sixth through Eighth	3
Seventh & Eighth	25
Mixed Grades & Subjects	3
Total	32

The most prominent looping grade configuration was seventh and eighth with 25 of 32 schools reporting this looping grade configuration. Three schools indicated a three year loop was used from sixth through eighth grades. One school's loop was from sixth to seventh grades. The final looping combination, *Mixed Grades and Subjects*, consisted of two to three year cycles and varied by subject in each school. Three schools described this mixed combination of grade configuration of looping use. Due to the focus of this study being science achievement, however, grade configuration was not examined beyond being descriptive of the looping cycles used in respondent looping middle schools.

While 32 schools indicated looping, nine looping schools were not included in the study. Schools were divided as having practiced looping in the subject area of science or not. Schools that did not loop in the subject area of science were not included in the study because the focus of the study was achievement in science. Six of the nine schools looped but not in science, the use of looping was as follows: two schools looped in most subjects; three schools looped in math only; and one school looped in two subjects, but not all students looped (Table 6).

Table 6

Looping Use in the Schools Excluded from Study

Reason for Exclusion	Subjects Looped	Number of Schools
	Most Major Subjects	2
No Loop in Science	Math Only	3
	Two Major Subjects	1
Looping Student Choice	All Major Subjects	1
Science Looped –No reportable PSSA data	All Major Subjects	2
Total Looping Schools Not Used in Study		9

The last three of the nine looping schools not included in the study looped in all subjects including science. One school looped all subjects between seventh and eighth grades, but allowed students the choice to join the loop or not. This school was not included in the study due to the inconsistent use of looping within the school's eighth grade class. The last two science looping schools were excluded from the study because there was no reportable data available on the PSSA results spreadsheet (PDE, 2011). The number of eighth grade students in these schools was not within a countable measure for inclusion in the PSSA data set (Table 6).

The remaining 23 questionnaires which indicated looping in the subject area of science also had variability in the extent of looping use. Twelve looping schools described looping in all subject areas. Five schools indicated looping was practiced in most major subject areas. Another five of the twenty-three reported looping in two subject areas, one of which was science. The final school stated that looping was practiced only in science (Table 7).

Table 7

Looping Use in the Schools Included in Study

Reason For Inclusion	Subjects Looped	Number of Schools
Science Looped	All Major Subjects	12
	Most Major Subjects	5
	Two Major Subjects	5
	Science Only	1
Total Looping Schools Used in Study		23

In addition to the nine looping schools excluded from the study, three non-looping schools were removed from the study's sample. The PSSA data for these three schools, as with two of the looping schools excluded from the study, was not reportable data because the number of eighth grade students in the school was not within a countable measure for inclusion in the PSSA data set. The study sample was 166 schools with 23 looping schools and 143 non-looping schools.

Upon opening the 2010 Science PSSA data report from the Pennsylvania Department of Education (2010), it was discovered that 909 schools were reported as having an eighth grade class which took the Science PSSA assessment. This is 79 more schools than were pulled from the *Find an Institution* link of the PDE database of schools for the questionnaire mailing in the Spring of 2011. This was a nine percent of the total population of schools with eighth grade students which took the 2010 PSSA Science assessment.

Prior to looking at the academic achievement data for the looping and non-looping schools of this study, the Pennsylvania State Level data for successful Science achievement of the 2010 eighth grade was reviewed. Successful completion of the assessment was determined by the percentage of students scoring in the advanced and proficient levels. The percentage of 2010 eighth grade students who achieved advanced and proficient levels on the Science PSSA assessment was 57.2% (PDE, 2011).

Table 8

Average 2010 Science PSSA Achievement for Eighth Grade

GROUP	Number of Schools	Science Achievement Average
Pennsylvania State Average	909	57.2
All Respondents	178	57.8
Non-Looping	143	58.3
All Looping	32	54.9
Looping -not included in study	9	57.7
Science Looping -included in study	23	54.1

Also examined prior to conducting the independent *t*-test was the average science achievement on the 2010 Science PSSA for each group of the study (Table 8). It was noted that the average of all respondents for this study was around the Pennsylvania State Average for science achievement. The non-looping schools average was 1.1 percentage points above the state average for science achievement. The average science achievement for all looping schools was 2.3 percentage points below the state average.

The nine looping schools excluded from the study had an average that was half a percentage point above the state science achievement average. And the looping schools included in the sample for the regression analysis were 3.1 percentage points below the state average for science achievement.

The following table summarizes the characteristics of the 166 schools that remained in the study (Table 9). The average number of students in the looping schools compared to the average number of students in the non-looping schools was a difference of 112 students. The difference between the average percent of advanced and proficient science achievement was 4.2 percentage points. The non-looping schools were 1/1 percentage points higher than the state average of 57.2% and the looping schools were 3.1 percentage points below the state average (PDE, 2011).

Table 9

Characteristics of Schools in Sample

Characteristic	Looping Schools	Non-Looping Schools
Number of Schools	23	143
Mean Number of Students Assessed per School	55.7	167.7
Mean Percent Advanced/Proficient Science	54.1%	58.3%

Results

Two assumption tests were calculated by the Graph Pad InStat program. The first assumption test Graph Pad InStat calculated was to determine homogeneity of variances. The results of this assumption test determined if the standard deviations or variances were equal. The F-value calculated was 1.453 with a p-value of 0.2009. This p-value suggests the difference between the variances deviations is not significant.

The second assumption test Graph Pad InStat calculated was to determine normality of distribution. Graph Pad InStat provided results for the Kolmogorov and Smirnov test. The KS value for non-looping was 0.1199 and for looping was 0.1687; the p-values were <0.0001 and 0.0885, respectively. Due to the robustness of the independent *t*-test and the sample size of the non-looping group, the departure from normality of the non-looping group is not critical (Kellermann, Bellara, Rodríguez de Gil, Nguyen, Kim, Chen, & Kromrey, 2013; TexaSoft, 2008).

Descriptive statistics are shown in Table 10. For the non-looping group, the sample size was 143; and for the looping group, the sample size was 23. The mean and standard deviations are also provided.

Table 10

Descriptive Statistics

Parameter	Looping Schools	Non-looping Schools
Sample Size	23	143
Mean	54.078	58.345
Standard Deviation	21.869	18.145

Given these descriptive statistics, the independent *t*-test results were provided to determine if the null hypothesis for this sample could be accepted or rejected. The null hypothesis for this study was:

Null Hypothesis.

There will be no significant difference in Science PSSA test scores between students who have experienced the practice of looping and those who have not.

H_0: $u_1 = u_2$

The *t*-statistic calculated by Graph Pad InStat was 1.016 with 164 degrees of freedom and the p-value was 0.311. This p-value is considered not significant when compared to a 0.05 level of significance. Results are shown in Table 11.

Table 11

Results of t-test Analysis (Looping vs. Non-Looping)

Means, Standard Deviations, and t-tests (PSSA Science Scores)

Group	n	M	SD	t	p=
Looping	23	54.078	21.869	1.016	0.311
Non-Looping	143	58.345	18.145		

CHAPTER FIVE: DISCUSSION

Introduction

Looping has been around for centuries and is used across the globe. The benefits are vast; the disadvantages minimal (Figure 3). Implementation requires dedication of the school administration and faculty. Middle school is a place where children are growing exponentially and need supports for academic, social, and emotional challenges as they grow. Fostering stable relationships is a key to the middle school philosophy (National Middle School Association, 2003). The basic premise of looping is to move the teacher with the students to the next grade to maintain the relationship started in the first year of the loop. The teacher starts the subsequent years of the looping cycle with knowledge of the students' abilities and needs. This knowledge enhances the potential that the teacher can aid students' ability to make achievement gains (Chirichello & Chirichello, 2001; Elliot & Capp, 2003; P. Freeman, 2007; Friedlaunder, 2009; Gregory, 2009; Lincoln, 1998a, 1998b, & 2000; Nichols & Nichols, 2002; Rodriguez & Arenz, 2007; Rotering, 2009; Snoke, 2007; Voyer, 2009; Yamauchi, 2003).

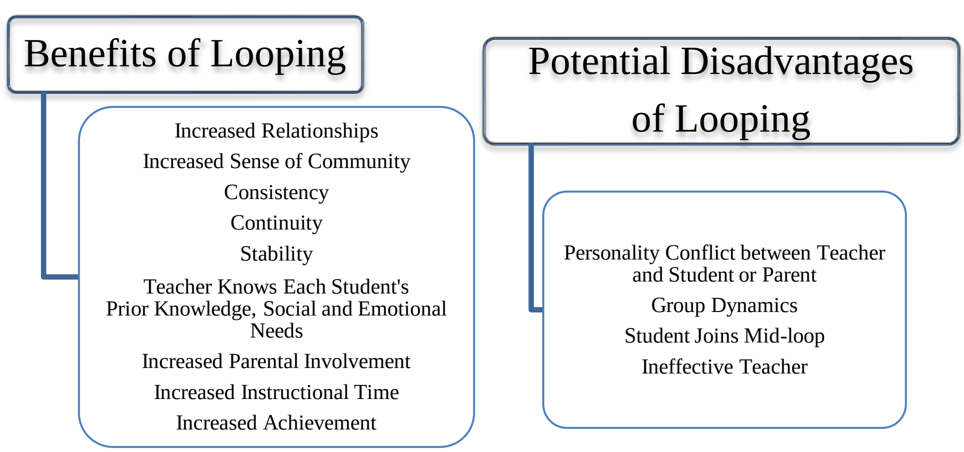

Figure 3

Based upon the situation at Mountain Middle School, this researcher wanted to examine the possibility that looping was an influencing factor of science achievement as reflected by scores on the Science Pennsylvania System of School Assessment (PSSA). Despite a preponderance of evidence to qualitatively support looping, the quantitative research regarding looping, historically, is lacking. Recently though, researchers have begun to look at looping more quantitatively. Specifically, recent studies provide support for increased academic achievement due to the use of looping (Blair, 2008; Caauwe, 2010; Friedlaender, 2009; Lindsay, Irving, Tanner, & Underdue, 2008; Orazi, 2012; Sterling, 2011). To add to these quantitative findings, this study purposed to determine if the use of the instructional delivery method of looping in a science classroom has a statistically significant impact on science achievement.

The study utilized 2010 PSSA data for eighth grade science assessment which is publicly available through the Pennsylvania Department of Education (PDE) website (www.education.state.pa.us). In addition to the use of this standardized assessment, information regarding the practice of looping within schools housing eighth grade was needed. A questionnaire (see Appendix C) was developed and distributed via the United States Postal Service to obtain the information regarding the practice of looping in the 2010 eighth grade class in respondent schools. Based upon the results of this questionnaire, responding schools were identified as looping or non-looping schools for comparison in the study.

An independent *t*-test was used to test the hypothesis. The independent variable used for analysis was the presence of the instructional practice of looping. The dependent variable of science achievement was defined as the collective percent of advanced and proficient scores on the PSSA Science assessment.

Summary of Findings

The null hypothesis stated there will not be a significant difference of test scores on Science PSSA tests between students who have been looped and students who have not been looped. The p-value calculated in Graph Pad InStat for the independent *t*-test was 0.3110 and is not significant when at a 0.05 level of significance. The results of the analysis, therefore, suggest that looping status does not contribute to science achievement for the sample of 2010 Pennsylvania eighth-grade schools included in the study.

Discussion

Many factors can influence a child's ability to attain academic success in school; it can be influenced by relationships with teachers, peers, parents, and members of the community at large. The structure of and supports within the school community can also impact a student's ability to achieve academically. Only some of the influences on a student can be controlled for within educational research studies.

The middle school concept was developed to address the middle school student's academic, social, and emotional needs (Lounsbury, 2009; Wilcox & Angelis, 2009). The middle school model asserts that middle schools should have rigorous curricula, appropriate instructional methods, expert faculty and staff, relevant relationships, safe environments, and strong parent connections (Andrews & Jackson, 2007; George, 2010; National Middle School Association, 2003; Wilcox & Angelis, 2009). Maslow's Hierarchy of Needs theory supports the middle school concept and ties directly to the looping concept as well (Booth, 2011; Little & Little, 2001; Rodriguez & Arenz, 2007). Looping meets the academic, social, and emotional needs of adolescence (Lounsbury, 2009; McCown & Sherman, 2002). Looping provides teachers the opportunity to get to know their students over an extended period of time. The increased time with students develops an understanding of prior content knowledge which is a key to increasing science achievement (National Research Council, 2006).

It is important to keep in mind that the primary purpose of looping is to create relationships which increase student growth and development. Looping was not necessarily developed as a means for academic gains (Forsten, Grant, Johnson, & Richardson, 1997; Grant, Johnson, Richardson, 1996; Little & Little, 2001; McCown & Sherman, 2002). That is not to say that looping does not provide the scaffolding which can lead to increased academic achievement (Anderson, 1998; George & Lounsbury, 2000). Another word of caution provided in the literature was to allow looping to be a choice by not only the parent/student but also a choice of the teachers to participate in the loop (Chirichello & Chirichello, 2001; Gaustad, 1998; Hume, 2007; Jacobsen, 1997b). Vann (1997) stated that voluntary participation decreases the likelihood of looping's disadvantages occurring.

Limitations of the Study

Schools, classrooms, teachers, and students are all complex beings and therefore difficult to study. In their book, *Making Big Schools Feel Small: Multiage Grouping, Looping, and Schools-Within-A-School*, George and Lounsbury (2000) stated that, "Extraneous factors are almost impossible to isolate when the research subjects are human" (p. 63). Keeping this in mind, the researcher acknowledges that there were limitations within the study. School districts across the state of Pennsylvania are given standards to which they are to teach children. However, school districts are also given the freedom to select the textbooks, curricula, and methods by which to teach the standards. There is non-uniformity in the following factors: teacher preparation; in-service and continuing education opportunities; and science facilities from teacher to teacher, school to school, and district to district. Additionally, the level of parent involvement, parent education level, and family structure/support varies from child to child. This list only scratches the surface of exogenous and endogenous extraneous variables that exist in the school population (George & Kaplan, 1998). Educational research attempts to control for these factors, or at the very least, acknowledge their existence.

The initial limitation of this study was the *ex post facto* nature of the research which prevented the researcher's ability to control for extraneous variables. Another component of the limitation of the research being conducted after the fact was the lack of randomization. The looping group was pre-established in the sample. The sample was obtained by voluntary response to a questionnaire sent in March 2011 via mailing through the United States Postal Service. The possibility existed that a school administrator would choose not to complete and return the questionnaire because the school had not performed well on the Science PSSA. The lack of participation in a study by all members of the population could possibly skew the representation of the population in the analysis. While this study had an ample sample size, the actual number of schools practicing looping in Pennsylvania is not known. Therefore, it is not known if the study sample was indicative of all looping schools. This study was also limited in time and scope. The PSSA assessment data evaluated was from only one grade level (eighth) from one school year (2009-2010) from one state (Pennsylvania).

During analysis, the researcher discovered an additional limitation for this study. This limitation involved the availability of information. The PDE database accessed through the PDE website provided filters to select schools and addresses for the mailing. During the 2010 PSSA assessment year, 909 schools took the science content assessment. When the PDE database was accessed to obtain school addresses, only 830 school addresses were recovered. This was a difference of 79 schools or 9% of all schools housing eighth grade students who took the 2010 Science PSSA. This study's sample size was robust enough this small percentage of unaccounted for schools should not have made a significant difference given the findings of the study regarding the impact of looping on science achievement. The researcher can presume that some schools closed from the 2009-2010 school year to the 2010-2011 school year. Beyond that presumption, the cause for the difference between the PDE database of schools and the number of schools which administered the 2010 PSSA Science assessment as reported on the PDE PSSA assessment data report is unknown. This lack of information prevented the researcher from providing all schools housing eighth grade the questionnaire and the opportunity to participate in the study.

Recommendations for Future Research

The suggestions of previous researchers for future research overlap with the findings and recommendations based upon the current study. Future studies need to be quantitative and experimental in nature (Anfara, 2009). Studies also need to be more longitudinal in scope (Anfara, 2009; Nichols, 2002). This study supports the need for further examination of achievement gains and the impact the practice of looping may have on that increase in achievement. Future studies need to account for confounding variables. When conducting quantitative studies on looping, Nichols (2002) asserted that it would be best to make attempts to control for confounding variables such as prior achievement and economic class. Carefully accounting for demographics needs to be included in analyses to fully examine any impact by looping or relationship between looping and achievement.

Many studies reviewed by this researcher were more narrowly defined in scope than the current study. Researchers have compared looping classrooms to non-looping classrooms within a school or within two similar school districts (Snoke, 2007; Sterling, 2011). The current study attempted to broaden the scope to the level of an entire state. Future studies need to expand the scope to larger populations to gain a larger sense of the use of looping and its impact. Additionally, the researcher needs to ensure the population being sampled is completely accessible.

Results from this study's questionnaire revealed a majority of respondent looping schools were practicing the instructional delivery method of looping by default, not by design. Seven of the 32 looping schools did not respond to the questionnaire prompt which asked why the school practiced the instructional delivery method of looping. Twenty-five schools did indicate the reason for looping being used in the school. Six schools reported that looping was practiced by design - to take advantage of the benefits of looping. The remaining nineteen schools indicated that looping was practiced by default and cited small school size and/or limited staff availability as contributing causes. An extension of this finding would be to examine the reason looping is used in various schools and classrooms. Further, future studies can examine whether the reason for looping in a school impacts the perceptions of the practice and if there is a difference in achievement between schools purposely practicing looping or those looping out of necessity.

This study's questionnaire also reviewed the subjects (curricula) involved and the grade configurations in which looping were practiced. The respondents indicated that looping was being used in the following ways within the studied middle schools: single subjects, two or more subjects, and all major content areas. Future studies may examine the impacts of looping across curricular areas. Additionally, the questionnaire from this study revealed that twenty-five of the thirty-two looping schools used looping across seventh and eighth grades. Only three looping schools from this study looped from sixth through eighth grades. The impacts of looping in two or three year cycles and which grade configurations are most effectively looped could also be examined.

One of the cautions indicated by the proponents of looping is that a participant (teacher, student or parent) can choose to join or not join the looping cycle. In schools where looping occurs by default, a choice to loop does not exist. Future research might examine the impact of looping on achievement and perceptions of and effects on academic success where looping is not a choice. Conversely, an examination could be made of students in high school and college who often voluntarily loop by selecting courses taught by the same instructor examining the impacts looping has on the relationship created due to a choice to join the loop and the achievement that occurs in those situations.

Conclusion

Given the qualitative and increasing quantitative support of looping, many researchers have wondered why more educational institutions are not looping (Baran, 2008; Elliot & Capp, 2003; Fenter, 2009; Snoke, 2007). This study could not statistically support looping having any impact on science achievement on the PSSA assessment. However, the evidence for use of looping in the middle school is supported by the theoretical framework and by the literature review conducted through the course of the study.

The National Research Council of the National Academies (2006) stated, “The domain of science is complex and multifaceted, requiring sustained effort and focused instruction for the learning to process” (p.49). The looping concept provides a framework of time, relationships, and student support which would enable a science teacher to deliver a consistent curriculum and developmentally appropriate instruction for students –at the elementary or middle school level. Having the knowledge of the content presented the previous year enables the teacher to more fully encourage achievement in the science classroom. Although this study could not contribute to the body of research supporting looping as beneficial to student science achievement, this finding does not detract from the numerous other benefits credited to looping.

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APPENDIX A

Penn*Link Post for Pilot

ATTENTION: School District/Building Administrator(s) responsible for the 2010 Fourth Grade Science PSSA Test

The following is an operational definition of LOOPING:

> Looping is when the teacher moves from one grade to the next in a curricular subject along with their students for at least two years of teaching and learning (Elliot, 1998; Gaustad, 1998; Hitz, Somers, & Jenlink, 2007; Kerr, 2005; Lincoln, 2000; Nichols & Nichols, 2002; Vann, 1997; Yamauchi, 2003 and McCown & Sherman, 2002).

Based upon this definition, answer the following question:

[ ] Yes, fourth grade students in (*insert school district & building name*) who took the 2010 Science PSSA Test were looped in science and/or other major subject(s).

[ ] No, fourth grade students who took the 2010 Science PSSA Test were not looped in this district/building.

APPENDIX B

IRB Application

9/07 **RESEARCH EXEMPTION REQUEST** Ref. # __________

Liberty University
Committee On The Use of Human Research Subjects

1. Project Title: IMPACT OF LOOPING ON MIDDLE SCHOOL SCIENCE ACHIEVEMENT TESTS

2. Please list all sources of funding. If no outside funding is used, state "unfunded": unfunded

3a. Principal Investigator(s) *[Must be a Liberty faculty member or investigator authorized by the Chair of the Institutional Review Board. If a student is the principal investigator, the student must have a faculty sponsor. Include contact information for both the student and the faculty sponsor as appropriate]*:

Name and Title	Phone, E-mail, correspondence address
Tammy M. Barger tmevans2@liberty.edu,	717-437-4324, 2585 Route 208 ~~Knox, PA 16232~~

3b. Faculty Sponsor

Name and Title	Dept., Phone, E-mail address
Dr. Karen Parker, Dean kparker@liberty.edu	School of Education Liberty University

Anticipated Duration of Study: Spring 2011 (From) Spring 2011 (To)

4. Are you affiliated with Liberty University? YES X NO ☐

If so, in what capacity? Doctoral candidate

5. Do you intend to use LU students, staff or faculty as participants in your study? If you do not intend to use LU participants in your study, please check "no" and proceed directly to item 6.

YES ☐ NO X

If so, please list the department and/classes you hope to enlist and the number of participants you would like to enroll. n/a

In order to process your request to use LU subjects, we must ensure that you have contacted the appropriate department and gained permission to collect data from them.

Signature of Department Chair:

______________________________ ______________________________
Department Chair Signature(s) Date

6. Briefly describe the purpose of the study.

Looping is a form of instructional delivery where a teacher remains with a group of students for more than one academic school year (Elliot, 1998; Gaustad, 1998; Hitz, Somers, & Jenlink, 2007; Kerr, 2005; Lincoln, 2000 and McCown & Sherman, 2002). The purpose of this study is to determine if looping is an influencing factor on achievement on standardized science tests at the eighth grade level in the Commonwealth of Pennsylvania.

7. Provide a lay language description of the procedures of the study. Address ethical issues involved in the study (See the Avoiding Pitfalls in section of the IRB website for helpful suggestions) and how you will handle them. For example, consider issues such as how subject consent will be obtained (or explain why the study meets waiver guidelines for informed consent), how the data will be acquired, and how the data will be stored confidentially once it is collected. Please attach pertinent supporting documents: all questionnaires, survey instruments, interview questions and/or data collection instruments, consent forms, and any research proposal submitted for funding.

School level data for eighth grade test results will be used which is available publically on the Pennsylvania Department of Education website. The PennLink list server of the Pennsylvania Department of Education will be used to find schools for the study. School administrators will respond that their eighth grade students have experienced looping or have not. Schools represented through initial response by school administrators will be given a code to ensure confidentiality within the study. The key to the code will be kept with all research data as described below.

Administrators that respond affirmatively will be asked to complete a follow-up survey pertaining to the specifics of looping in their school. The information collected regarding the extent and/or conditions of looping will be electronically obtained through responses to the principal investigator's Liberty email account. The survey data and all research records will be printed as a hard copy in then stored in a locked cabinet by the principal investigator. Electronic versions will be appropriately deleted. Access to collected data will be limited to the principal investigator; no other persons will be conducting analysis.

Using the responses of school administrators and math and reading Pennsylvania Stat Standardized Assessment data, schools will be placed in study groups. After control and treatment group placement, the schools' Pennsylvania State Standardized Assessment science data will be used to statistically determine if there is a difference between the means of the two groups, using a matched two sample *t*-test. That is if schools where looping occurs have greater achievement than schools where looping does not occur in the testing area of eighth grade science.

After the completion of the study, the hard copies needed for research completion will be kept in the secured location for an appropriate period of time, as directed by the committee chair, then destroyed.

8. Will subject's data be gathered anonymously? YES NO X

9. Please describe the subjects you intend to recruit. For example, minors under age 18, adults 18 and over, students, etc. Also, please describe your recruitment procedures. How will you find participants for your study? How will you contact them? Please be explicit.:

No human subjects will be contacted for individual data. School administrators will be contacted solely to determine placement in treatment versus control groups and provide information on the details of looping taking place in their school(s).

See application instructions for each above item below. Email form and supporting materials to irb@liberty.edu. Also, submit a hard copy of the form and supporting materials to: The Institutional Review Board (IRB), Campus North Suite 1582, 1971 University Blvd, Lynchburg, VA 24502.

RESEARCH EXEMPTION REQUEST FORM INSTRUCTIONS FOR EACH ITEM

1. **Project Title.** Please use the project title that is used in the application for funding. Please remain consistent in your use of the project title. A future change in the project title will require a completed Revision of Protocol Form.
2. **Funding Source.** All sources of funding should be listed. If no outside funding is used, state "unfunded." Please note whether funding is pending. If you have submitted a federal grant application for funding for this project, a

copy of the grant application must be attached to the original of the submitted application.

3. **3.a: Principal Investigator(s).** The principal investigator (PI) must be a Liberty faculty member or investigator authorized by the IRB Chair. If a student is the principal investigator, a faculty sponsor is required and should be listed in 3b. Please provide each PI's name and contact information. **3.b.:** As needed, list the faculty sponsor's name and contact information. Much of the Committee's contact with the PI will be through e-mail. As such, it is important that the information be legible.
4. **University Affiliation:** Is the PI student, staff or faculty of Liberty University?
5. **Liberty University participants:** If the PI intends to use LU students, staff or faculty, permission must be obtained from the desired department in addition to IRB approval.

6. **Purpose of the Study.** Please describe in nonscientific terms the purpose of this study. In other words, why are you wanting to do this study (excluding degree requirement)?
7. **Specific procedures to be followed.** This should be a lay language description of the procedures of the study. Address ethical issues involved in the study (See Design Tips for helpful suggestions) and how you will handle them. Focus on issues such as how subject consent will be obtained (or explain how the study meets waiver guidelines for informed consent), how the data will be acquired, and how the data will be maintained once it is collected. Please attach pertinent supporting documents: all questionnaires, survey instruments, interview questions and/or data collection instruments, consent forms, and any research proposal submitted for funding.
8. **Will subject's data be gathered anonymously?** Do not confuse anonymous with confidential. For a study to be anonymous, there must be no possibility for the PI or anyone else to ascertain the identity of the subject(s).
9. **Type of subjects to be employed and recruitment procedures.** Please describe the subjects you intend to recruit. For example, minors under age 18, adults 18 and over, students, etc. Also, please describe your recruitment procedures. How will you find participants for your study? How will you contact them? Please be explicit.

Submit the original Research Exemption Request plus supporting documents via email and hard copy. It is recommended that the researchers keep a copy of their request for themselves.

Initial PennLink post:

ATTENTION: School District/Building Administrator(s) responsible for the 2010 Eighth Grade Science PSSA Test

The following is an operational definition of LOOPING:

> Looping is when the teacher moves from one grade to the next in a curricular subject along with their students for at least two years of teaching and learning (Elliot, 1998; Gaustad, 1998; Hitz, Somers, & Jenlink, 2007; Kerr, 2005; Lincoln, 2000; Nichols & Nichols, 2002; Vann, 1997; Yamauchi, 2003 and McCown & Sheman, 2002).

Based upon this definition, answer the following question:

[ ] Yes, eighth grade students in (*insert school district & building name*) who took the 2010 Science PSSA Test were looped in science and/or other major subject(s).

[ ] No, eighth grade students who took the 2010 Science PSSA Test were not looped in this district/building.

Questionnaire to gain information regarding looping use and conditions from respondents who indicate looping occurred with their 2010 Eighth Grade classes.

In response to a *PennLink* post, you indicated that your school district/building 2010 eighth grade students who took the Science PSSA Test were looped in science and/or other major subject.

Again, the following is an operational definition of LOOPING:

> Looping is when the teacher moves from one grade to the next in a curricular subject along with their students for at least two years of teaching and learning (Elliot, 1998; Gaustad, 1998; Hitz, Somers, & Jenlink, 2007; Kerr, 2005; Lincoln, 2000; Nichols & Nichols, 2002; Vann, 1997; Yamauchi, 2003 and McCown & Sheman, 2002).

Please answer the following questions about the use of and conditions for looping in your district/school as pertain to the eighth grade students who took the Science PSSA Test in the spring of 2010.

The 2010 Eighth Graders were looped in the following subjects (circle the grades in which looping occurred)

SUBJECT	GRADES LOOPED		
Science	6th	7th	8th
Math	6th	7th	8th
Reading	6th	7th	8th
Language Arts	6th	7th	8th
Social Studies	6th	7th	8th
Other (specify)	6th	7th	8th

Looping is utilized in this district/building for the following reason(s) (circle all that apply):

- By design, due to the benefits of looping
- By default, due to the needs of building the schedule
- Other (specify)

Historically, looping has been occurring in this district/building (circle one) for ____ years.

August 31, 2010

Ms. Tammy Evans
Strodes Mills Middle School

Dear Ms. Evans:

It has been approved for you to post a survey for educational purposes on Penn Link.

It will be posted under your personal name with all responses to the survey going back to you.

Good luck with your doctoral program dissertation.

Superintendent of School District

From: IRB, IRB
Sent: Friday, January 21, 2011 10:02 AM
To: Evans, Tammy M
Cc: Parker, Karen L; Garzon, Fernando; IRB, IRB
Subject: IRB Approval 1042.012111: Impact of Looping on Middle School Science Achievement Tests

Good Morning Tammy,

We are pleased to inform you that your above study has been approved by the Liberty IRB. This approval is extended to you for one year. If data collection proceeds past one year, or if you make changes in the methodology as it pertains to human subjects, you must submit an appropriate update form to the IRB. Attached you'll find the forms for those cases.

Thank you for your cooperation with the IRB and we wish you well with your research project. We will be glad to send you a written memo from the Liberty IRB, as needed, upon request.

Sincerely,

Fernando Garzon, Psy.D.
IRB Chair
Associate Professor
Liberty University
1971 University Blvd.
Lynchburg, VA 24502
(434) 592-4054

ANNUAL REVIEW

For projects in which data collection lasts longer than one year, an annual review form must be submitted to the
IRB Chair. It is the principal investigator's and faculty sponsor's responsibility to turn in this form by the end of
11 months of the project's start date in order for review to take place for continued data collecting.

ANNUAL REVIEW FORM
Liberty University

LOG NUMBER _________
ORIGINAL REVIEW DATE _Jan 2011_
LEVEL __EXEMPT **X** EXPEDITED __FULL

Principal Investigator ____Tammy M. Barger___ Phone Number _717-437-4324_

Correspondence Address __2585 Route 208, Knox, PA 16232____ Email __tmevans2@liberty.edu___

Department __Education__ Faculty Rank/Student Status _Student_____

Project Title IMPACT OF LOOPING ON MIDDLE SCHOOL SCIENCE ACHIEVEMENT TESTS

Type of Project: FACULTY RESEARCH ___
STUDENT DIRECTED RESEARCH
Thesis____ Dissertation _**X**__ Other ____ (Specify: _____________________________)

Duration of Project: Starting Date _Spring 2011__ Expected End Date __Summer/Fall 2012__

****
Please answer the following questions**.** If you need to review your original application or if you have any questions, please contact Dr.
Fernando Garzon, (434) 592-4054, e-mail: fgarzon@liberty.edu

1. **PROJECT STATUS:**

_X_ Continuing with no changes in procedure, risk, or class of human subjects as outlined in the approved protocol. [Note: A
"Change-In-Protocol Form" is required for any changes.]

Research is expected to be done by _ Summer/Fall 2012__.

____ Research has not been started yet, but is expected to begin on ________________.

____ Completed. No more research to be done.

____ Research will not be done.

FOR CONTINUING ACTIVITY. PLEASE ANSWER THE FOLLOWING

1. Number of subjects studied to date _Mailing was completed in Spring 2011/Data from mailing has not been analyzed __.

If continuing, total number of subjects to be studied ___________________.

2. Have any risks or untoward results of this activity become apparent since the last review?

_____ Yes _X_ No

If yes, please attach explanation

3. Where are signed consent forms being kept? (indicate room and building) _locked box in principal investigator's home__.

4. Attach any additional information which may be useful to the reviewers.

5. Comments:
No changes are being requested, mailing was completed, extension is necessary to complete the data analysis and finalize the project.

I/we certify that the approved protocol and the approved method for obtaining informed consent has been and will continue to be followed.

____

____

Principal Investigator Date Faculty Sponsor/Advisor (if necessary) Date

****

ACTION TAKEN:

_______ No further review required

_______ Further review required in ____ one year _____ (days) (weeks) (months)

____

Chairperson, IRB Date

IRB Approval 1042.012111 Annual Review Approval
Tuesday, February 14, 2012 2:54 PMIRB, IRB
To: Barger, Tammy M
Cc: IRB, IRB; Parker, Karen L

Good Afternoon Tammy,

Thank you for submitting your annual review form to us. In reviewing your form and identifying that there are no changes to your protocol, the Liberty IRB grants approval for your data collection to continue for an additional year. As with your original approval, if your data collection proceeds past January 21, 2013, you will need to submit another annual review form. Additionally, if there are any changes to your approved protocol, you will need to submit a change in protocol form to us prior to implementing any changes unless the changes are for the protection of your participants.

Please do not hesitate to email us with any questions. Best wishes as you continue with your research!

Sincerely,

G. Michele Baker
Institutional Review Board Coordinator
The Graduate School

(434) 522-0506

APPENDIX C

Questionnaire

ATTENTION: School District/Building Administrator(s) or Guidance Counselor

responsible for the 2010 Eighth Grade Science PSSA Test

RE: ***A quantitative study on looping in middle schools***

REPLY TO: tmevans2@liberty.edu OR use the enclosed self-addressed envelope

PLEASE RESPOND BY: Friday, March 11, 2011

Thank you for your time!

The following is an operational definition of LOOPING:

> Looping is when the teacher moves from one grade to the next in a curricular subject along with their students for at least two years of teaching and learning (Elliot, 1998; Gaustad, 1998; Hitz, Somers, & Jenlink, 2007; Kerr, 2005; Lincoln, 2000; Nichols & Nichols, 2002; Vann, 1997; Yamauchi, 2003 and McCown & Sherman, 2002).

Based upon this definition, select the appropriate response regarding your 2010 eighth grade class:

[ ] No, eighth grade students who took the 2010 Science PSSA Test were not looped in **(*INSERT school district & building name*)** ____.

[ ] Yes, eighth grade students in who took the 2010 Science PSSA Test were looped in science and/or other major subject(s) in **(*INSERT school district & building name*)** ____.

IF you indicated YES, the eighth grade students who took the 2010 Science PSSA Test were looped in science and/or other major subject(s), please answer the following questions about the use of and conditions for looping in your district/school *as pertain to the eighth grade students who took the Science PSSA Test in the spring of 2010*.

The 2010 Eighth Graders were looped in the following subjects (circle/indicate the grades in which looping occurred).

SUBJECT GRADES LOOPED

Science	6th	7th	8th
Math	6th	7th	8th
Reading	6th	7th	8th
Language Arts	6th	7th	8th
Social Studies	6th	7th	8th
Other (specify)	6th	7th	8th

Looping is utilized in this district/building for the following reason(s) (circle/indicate all that apply):

- By design, due to the benefits of looping
- By default, due to the needs of building the schedule
- Other (specify)

Historically, looping has been occurring in this district/building for ___ years.

STATEMENT OF CONSENT for STUDY INCLUSION

IMPACT OF LOOPING ON MIDDLE SCHOOL SCIENCE ACHIEVEMENT TESTS

Tammy M. Barger
Liberty University
Education Department

Responding to this mailing indicates consent for your school's data to be used in the above named study as described below.

Participation is voluntary and not compensated in any way.

Schools will be coded to maintain confidentiality.

Purpose of Study: Looping is a form of instructional delivery where a teacher remains with a group of students for more than one academic school year (Elliot, 1998; Gaustad, 1998; Hitz, Somers, & Jenlink, 2007; Kerr, 2005; Lincoln, 2000 and McCown & Sherman, 2002). The purpose of this study is to determine if looping is an influencing factor on achievement on state standardized science tests at the eighth grade level in the Commonwealth of Pennsylvania.

Procedure: School level data for eighth grade test results will be used which is available publically on the Pennsylvania Department of Education website. A questionnaire distributed through by the US Postal Service will be used to find schools for the study. School administrators will then respond that their eighth grade students have experienced looping or have not and the school's practice of looping if applicable.

School responses will be given a code to ensure confidentiality within the study.

Using the responses of school administrators and math and reading Pennsylvania System of School Assessment (PSSA) data, schools will be placed in matched pair study groups. After study group placement, the schools' PSSA science data will be used to statistically determine if there is a difference between the means of the two groups, using a matched two sample *t*-test. That is, if schools where looping occurs have greater achievement than schools where looping does not occur in the testing area of eighth grade science.

Questions? If the primary researcher is not able to answer your questions or concerns regarding the study, please contact: Dr. Karen Parker, Dean of the School of Education, Liberty University at kparker@liberty.edu

REFERENCES

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