Analysis of the Impact of Implementing Interdisciplinary Pods on Student Achievement in Georgia Middle Schools

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AN ANALYSIS OF THE IMPACT OF IMPLEMENTING
INTERDISCIPLINARY PODS ON STUDENT ACHIEVEMENT
IN GEORGIA MIDDLE SCHOOLS

by

Andrew Lynn Bristow

Abstract of a Dissertation
Submitted to the Graduate School
of The University of Southern Mississippi
in Partial Fulfillment of the Requirements
for the Degree of Doctor of Philosophy

August 2012
ABSTRACT

AN ANALYSIS OF THE IMPACT OF IMPLEMENTING INTERDISCIPLINARY PODS ON STUDENT ACHIEVEMENT IN GEORGIA MIDDLE SCHOOLS

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August 2012

With the increasing demands for middle schools to meet Annual Yearly Progress and the Annual Measurable Objective levels of the No Child Left Behind Act (2002) middle school principals are faced with decisions to incorporate the appropriate middle school instructional model. This study examined the longitudinal achievement data of sixth and seventh grade reading, English language arts, and math on the Georgia Criterion Reference Competency Test (CRCT) in 20 middle schools from 2008 – 2011 in a large suburban school district in Georgia. Of the schools, two implemented a junior high model, six implemented an interdisciplinary pod model, and twelve implemented an interdisciplinary team model. The student achievement data was collected from the School Performance Summary Reports that are compiled by the Georgia Department of Education for the years 2008 – 2011.

Three of the research questions were designed to examine if a particular type of instructional model used by the middle schools influenced student achievement. After testing each of three hypotheses it was determined that there was no significant difference in academic achievement for reading, English language arts, or math when compared to the instructional model. Nor was there a significant difference between the instructional model and its implementation in either sixth or seventh grade.
This study also asked a fourth question that evaluated the perception of middle school principals and the instructional model. This was accomplished using a survey that was developed specifically for this study. Based on the answers provided by the principals, it was established that there was no significant difference between the perception of middle school principals and student achievement. However, the majority of the principals indicated that they preferred one model to another. Additionally, the majority of the principals agreed that the instructional model used at their school was based on external influences and that they would choose to change to an interdisciplinary pod model if given the opportunity.
AN ANALYSIS OF THE IMPACT OF IMPLEMENTING INTERDISCIPLINARY PODS ON STUDENT ACHIEVEMENT IN GEORGIA MIDDLE SCHOOLS

by
Andrew Lynn Bristow

A Dissertation Submitted to the Graduate School of The University of Southern Mississippi in Partial Fulfillment of the Requirements for the Degree of Doctor of Philosophy

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CHAPTER I
INTRODUCTION

The modern middle school within the United States is a result of many transitions and school reforms over the decades of American education. These types of schools were originally established over 50 years after the inception of the junior high school model in the year 1909. Originally, junior high schools were developed to relieve heavily populated suburban high schools due to the onset of more mechanized industrial factories and the compulsory education laws (Moss, 1969). In addition, these schools were intended to help decrease the dropout rate of students after eighth grade since schools during this time were typically set up as grades one through eight and nine through twelve. Over time the junior high school model came under heavy scrutiny for not meeting the emotional, social, educational, and physical needs of students between the ages of eleven and fourteen (Lounsbury, 2009; Lounsbury & Vars, 2003).

In the early 1960s many educators and government officials decided that the junior high concept of education was not effective due to the specific adolescent needs of these students (Bedard & Do, 2005; National Middle School Association (NMSA), 1995). William Alexander, considered the “father of the American middle school” (Davis, 2008; Lounsbury, 2009; McEwin & Greene, 2009), suggested modifying the junior high school concept by separating the students into three distinct levels of education (Alexander, 1968; Alexander & Williams, 1968). The term middle has also become a descriptor not only for the school but for the students who were in between childhood and adolescent.

Alexander (1968) also stated that the middle school by definition should contain at least three grades and include at least grades six and seven with students between the
ages of 10 and 14 in the same building and educational environment (Alexander, 1968; Davis, 2008; Lounsbury, 2009). In addition, the middle school should also cater to the learning needs of young adolescents (Alexander & McEwin, 1989; Cruz, 2003; Friedman, Hartshorne, & Algozzine, 2005). Overall, the premise of the middle school concept was to separate the students based on their educational, social, and emotional needs (Alexander et al., 1969; Wiles & Bondi, 2001). According to McEwin, Dickinson, and Jenkins (1996) this grade and age configuration best meets the emotional and social needs of the young adolescent (McEwin, Dickinson, & Jenkins 1996). Furthermore, the movement of junior high school to a middle school model suggested that the junior high school model was ineffective at meeting all the needs of students (Davis, 2008).

Between the 1960s and 1980s, much of the middle school reform was slow until 1982 and the release of the position paper by the National Middle School Association (NMSA) *This We Believe* (NMSA, 1982) followed in 1983 with *A Nation at Risk* report by The National Commission on Excellence in Education (1983). From this middle school educators become more focused on the child-centered concept of the middle school model (Marx & Harris, 2006). In addition, the NMSA released ten strategies middle schools should have to be successful: (a) educators knowledgeable about and committed to young adolescents; (b) a balanced curriculum based on student needs; (c) a range of organizational arrangements; (d) varied instructional strategies; (e) a full exploratory program; (f) comprehensive advising and counseling; (g) continuous progress for students; (h) evaluation procedures compatible with nature of young adolescents; (i) cooperative planning; and (j) positive school climate. These papers were also a catalyst for pushing more junior high schools towards the middle school concept.
In 1989, the Carnegie Council on Adolescent Development (CCAD) of the Carnegie Corporation published a position paper *Turning Points: Preparing American Youth for the 21st Century* (CCAD, 1989) that highlighted eight major recommendations to improving education for middle school students in their position paper (CCAD 1989): 
(a) create small communities for learning; (b) teach a core academic program; (c) ensure success for all students; (d) empower teachers and administrators to make decisions about the experiences of middle grade students; (e) staff middle grade schools with teachers who are expert at teaching; (f) improve academic performance through fostering the health and the fitness of young adolescents; (g) re-engage families in the education of young adolescents; and (h) connect schools with communities. In addition, this position paper called for the replacing of the junior high school models with the middle school model, thus resulting in schools moving towards a team based middle school concept (Davis, 2008; Flannery, 2007).

Eleven years later, Andrews and Jackson published *Turning Points 2000: Educating Adolescents in the 21st Century* (Jackson & Davis, 2000) and in 2009 Jackson published New Middle Schools for New Futures where in both publications middle school reform is examined from 1989 through 2000 and 2009 respectively. Both papers conclude that very little had changed in overall middle school performance since 1989. In addition flawed programs and federal mandates like No Child Left Behind have done little for school improvement in middle schools over the past two decades. Jackson also notes in paper that middle schools in the future must be more global by focusing on students as a whole not just on academics (Jackson, 2009).
Even with the daunting data over the past century the overall focus for improving middle schools was on the true middle school concept. This model placed students into interdisciplinary teams that consist of a group of teachers and their students. Often these groups were isolated from other students in the same grade and school. This creates an environment where students only interact with others within their group, becoming a family within the school. In addition, this concept innately made groups of students that were smaller and easier to work with which can lead to more positive attitude towards learning (Lee & Smith, 1993). This model also encouraged more interactions between students, teachers, and parents. The middle school concept helped students through emotional, social, and physical maturity as most during this time period are going through puberty (Davis, 2008; Northwestern State University, 2003; Walker, 2002). Even though the middle school concept has been around since the 1960s parents, politicians, and even educators continue to criticize middle schools and their approaches to educating young adolescent students. These schools with all of the difficulties and issues with the emotional and social needs of adolescents, conform to Piaget’s theories on the cognitive and social interactions of adolescents (DeVries, 1997; Smith, 1985).

In Robert Marzano’s book Designing a new taxonomy of educational objectives (2000), he states that students must be exposed to Three Systems and The Knowledge Domain in order to be truly successful. The systems are named Self-System, Metacognitive System, and Cognitive System. As students are exposed to new topics in education each system helps to determine how students will tackle the task. A student under the Self-System decides whether he or she would engage in the activity or would continue with current behavior. When students track their progress they set goals through
the Metacognitive System. As they process material, the Cognitive System synthesized the content that is within the Knowledge Domain (Marzano, 2000). These processes are important for developing the middle school student. Roeser and Eccles (1998) described the middle school student as an adolescent who has decreasing perceptions of the importance of education and their own self-esteem.

More importantly, by following Alexander’s original concept of the middle school configuration and the concept of the modern middle school prescribed by Erb in 1999, middle schools ought to focus on and be a time for social, emotional, and academic growth of American youth (CCAD, 1989; Davis & Thompson, 2004; Erb, 2006; Erb & Stevenson 1999; Jackson & Davis 2000). In the early 2000s many middle schools were participating in at least one type of middle school model. However, as budget restraints are being imposed, schools are changing the models or moving away from them all together. In Chicago and New York, schools are moving back to K-8 programs or to programs that have smaller grade grouping to capitalize on more individual settings (Weiss & Kipnes, 2006).

With the introduction of No Child Left Behind Act (NCLB) in 2001, 20 U.S.C. § 6319 (Godwin & Kremerer, 2002; NCLB, 2008) the essential goal was to improve education and the educational system. As part of NCLB every teacher, administrator, superintendent, and principal was held accountable for the education of all children in the U.S. NCLB affected the laws concerning school accreditation, thus making student achievement a focus for politicians, parents, and school administrators. This accreditation is referred to as Adequately Yearly Progress (AYP). NCLB (2002) required that states demonstrate annual progress in raising the percentage of students proficient in
reading and math. Through testing that is mandated in grades three through eight and once in grades ten through twelve (U.S. Department of Education, 2007; U.S. DOE, 2010), students are to demonstrate mastery of standards. Schools and systems must demonstrate increases in student achievement to meet AYP requirements. In addition, states are required to show a narrowing of the gap between advantaged and disadvantaged students or what is referred to as subgroup populations. Through NCLB schools are held accountable for the adequate progress of all students in reading and math regardless of race, economic status, disability, or language (U.S. DOE, 2007).

Georgia law, as amended by the A+ Education Act of 2000 required that all students in grades one through eight take the CRCT in the content areas of Reading, English Language Arts, Math (Georgia Department of Education, 2007b; U.S. DOE, 2010). Students in grades three through eight are also assessed in Science and Social Studies. This test was implemented in the spring of 2000 as a summative, end of year assessment in reading, English language arts, and math for grades four, six and eight. In 2002, the test was administered in grades one through eight and continues today.

The CRCT (GaDOE, 2007b) was designed to measure how well students acquire, learn, and accomplish knowledge and skills set forth in a specific curriculum or unit of instruction. Thus the CRCT was designed to test how students perform on the Georgia Performance Standards (GPS). This is different than Norm-referenced tests (NRT), such as the Iowa Test of Basic Skills (ITBS), which measures instructional standards commonly taught throughout the entire U.S. Additionally, the NRTs highlight differences between and among students across the achievement curriculum, where as the CRCT specifically measures student knowledge of state standards. Georgia law also uses
the CRCT as a gateway test for grades three, five and eight. Students who pass both the reading and math portions of the CRCT and have passing grades in core subject areas are promoted to the next grade level (GaDOE, 2007a; GaDOE, 2007b).

Theoretical Framework

The research on middle school education varies and is often built around either the educational, social, developmental, or emotional needs of young adolescent students. Howard Gardner developed a theory that uses eight multiple intelligences that educators should use when developing lessons for students (Gardner, 2004; Gardner, 2008). These should include a variety of strategies that can be used to reach individual student needs. When students are grouped, teachers become more familiar with their students by working closely with colleagues who also teach the same students. Through this process teacher lessons will be better developed to meet the strengths and weaknesses of each individual by targeting the way they learn through their specific learning style or intelligence (Baran, 2008; George & Loundsbury, 2000; Gregory, 2009).

Socially, students will experiment with friendships as they develop physically and emotionally (Bernstein, 2002). In addition, as these students develop mentally during the three years of middle school they are exposed to different topics, experiences, and their ability to understand and apply knowledge varies (Ojose, 2008; Piaget, 1977). Grouping students in teams allows students to work through their differences while being overseen by adults who work together for their common good. This positive outcome is supported by the social development theory of Vygotsky (1978).

By combining the theories of Vygotsky and Piaget, students are more adept to succeed in middle school if given the proper environment (Alexander, 1968; Blake &
Pope, 2008; Erb & Doda, 1996). This environment is found in the middle school model where students are placed in a grade 6-8 environment and are given opportunities to develop socially and emotionally while learning.

Purpose of Study

With the convergence of accountability and the imposing mandates of No Child Left Behind Act of 200, 20 U.S.C. § 6319 (2002), this study was designed to understand if the middle school concept of interdisciplinary pods has an impact on student achievement in sixth and seventh grade reading, English language arts, and mathematics as measured by the Georgia Criterion Reference Competency Test (CRCT) in suburban Georgia middle schools. The study examined the achievement of all students at 20 schools in a large school district, using mean scale score for the school years 2008 – 2011. Additionally, this study investigated the perception principals on the implementation of middle school models within the 20 schools.

Significance of the Study

As budget constraints are placed on educational systems in Georgia, districts have to reduce teaching forces at schools. Middle school principals are now facing decreased staffing and have to make decisions about scheduling a building with fewer teachers while maintaining the same number of students. With these issues middle schools in Georgia can choose instructional models based on their overall students population and number of teachers. To help principals make tough decisions the objective of this study was to determine if there is a difference in assessment scores in middle schools that implement interdisciplinary pods compared to schools that implement grade level interdisciplinary teams or other middle school models. In addition, this study surveyed
principals to see if there are reasons other than student achievement that may determine the type of middle school model and if principals would choose another middle school model if given the opportunity.

This study examined the history of interdisciplinary teams and their impact on student achievement for sixth and seventh grade students in suburban middle schools in Georgia. Through archival data obtained and analyzed from a four-year period this study compared if interdisciplinary pods have impacted student achievement in math, reading, and language arts in Georgia middle schools grades six and seven as measured by Georgia’s Criterion-Referenced Competency Tests (CRCT).

Procedures for Study

Since the primary concern of the research is on the impact of interdisciplinary pods on student achievement in grades six and seven, this study will compile student CRCT data over a four-year period for sixth and seventh grade students. The data was be categorized into three groups. Group I students who were not in interdisciplinary pods when they were in sixth grade and then were placed onto interdisciplinary pods when they moved into seventh grade. Group II students who were in interdisciplinary pods in both sixth and seventh grade. Group III students who were never in an interdisciplinary pod in either sixth or seventh grade. Growth differences across four years will determine if there is a significant impact of interdisciplinary pods on student achievement.

Research Questions

This study examined whether there was a difference in student achievement based on either the implementation of interdisciplinary teams, interdisciplinary pods, or other middle school models.
The following research questions guided this study:

1. Is there a difference in between student achievement on CRCT Reading scores and interdisciplinary pods for students in sixth and seventh grade?
   
   \( H_{01} \): There is no relationship between student achievement on CRCT Reading scores and interdisciplinary pods for students in sixth and seventh grades.

2. Is there a difference in between student achievement on CRCT English Language Art scores and interdisciplinary pods for students in sixth and seventh grade?
   
   \( H_{02} \): There is no relationship between student achievement on CRCT English Language Art scores and interdisciplinary pod for students in sixth and seventh grades.

3. Is there a difference in between student achievement on CRCT Math scores and interdisciplinary pods for students in sixth and seventh grade?
   
   \( H_{03} \): There is no relationship between student achievement on CRCT Language Arts scores and interdisciplinary pod for students in sixth and seventh grades.

4. Is there a difference in between student achievement and the perception of principals on the benefits of interdisciplinary pods or other middle school instructional models?
   
   \( H_{04} \): There is no difference between student achievement and the perception of principals on the benefits of interdisciplinary pods or other middle school instructional models.
Definition of Terms

*Academic Achievement:* Students’ performance level based on the Georgia Criterion Reference Competency Test (GaDOE, 2007b).

*Adequate Yearly Progress (AYP):* As defined by the GaDOE AYP (2007b) is the cornerstone of the federal No Child Left Behind Act of 2001. It is a measure of year-to-year student achievement on statewide assessments (GaDOE, 2007b).

*Annual Measurable Objective (AMO):* The yearly target for the percentage of students required to be proficient or above for a school to make AYP (U.S. DOE, 2010).

*Exploratory programs:* Elective course offerings that students take during the school day that can be self selected and usually consist or fine arts programs, health, physical education, and career technology courses (GaDOE, 2007b).

*Georgia Criterion Reference Competency Test (CRCT):* Given in all Georgia public schools it is a performance based assessment designed to measure how well students acquire the skills and knowledge described in the Georgia Performance Standards. The assessments yield information on academic achievement at the student, class, school, system, and state levels (GaDOE, 2007b).

*Georgia Performance Standards (GPS):* Provide clear expectations for assessment, instruction and student work. They define the level of work that demonstrates achievement of the standards, enabling a teacher to know “how good is good enough.” Performance standards incorporate content standards, but expand upon them by providing suggested sample tasks, sample student work and teacher commentary (GaDOE, 2007b).
Grade Level Configuration: A grouping of grades consisting of at least three and no more than five educational levels or grades (GaDOE, 2007b).

Interdisciplinary Pod: A group of four or five teachers working with a set group of students teaching the core subject areas with less than five percent of students who move to move to another pod or team during the academic portion of the school day. (Defined for the purpose of this study)

Interdisciplinary Team: Consists of two to ten core academic teachers who share the responsibility and accountability for planning and teaching a common group or grade level of students (GaDOE, 2007b).

Junior High School: A school that has a grade six to eight configuration with academic disciplines departmentalized with a focus on content (GaDOE, 2007b).

Middle School: A school that has a grade six to eight configuration with each grade level having some form of interdisciplinary team (GaDOE, 2007b).

No Child Left Behind (NCLB): The 2001 reauthorization of the former Elementary and Secondary Education Act of 1965, that requires states to develop assessments in basic skills to be given to all students in certain grades, if those states are to receive federal funding for schools (NCLB, 2002).

Pod: A group of teachers working with a set group of students teaching the core subject areas usually within a defined geographic location within the school building. (Defined for the purpose of this study).
Summary

Since 1964, when the idea of middle schools was proposed by William Alexander, middle school education has been under scrutiny for its ability to actually meet the educational, social, and emotional needs of middle aged adolescents. In addition, the legal and political implications of the NCLB act of 2001 (NCLB, 2002) have increased the accountability placed on all school levels, including middle schools. Although today many middle schools follow some sort of middle school model, investigating the impact of interdisciplinary pods on middle school achievement is important for educators as funds have been limited over the past several years. This study compared two aspects of middle school education and how they impact student achievement over a four-year period.
CHAPTER II

REVIEW OF LITERATURE

Introduction

Chapter II provides a review of literature on the middle school adolescent, a brief historical background on middle school education, information on interdisciplinary teaming, accountability in schools, and student achievement. This chapter serves as a review of literature on the impact of middle school education and student achievement.

The Middle School Theory

There have been numerous studies in the field of education on educating students at the middle school level. This study on the middle school interdisciplinary pods is in part based on the efforts and findings of several theorists: Piaget, Vygotsky, Gardner, and Marzano. There is a common thread among these theories and the learning ability of middle school aged adolescents. Piaget, noted French psychologist, developed the theory that the adolescent student learning is based on concrete operational and formal operational processes (Ojose, 2008; Piaget, 1970). Students will enter sixth grade as a child and exit three years later as an adolescent. They will grow physically, emotionally, and socially; experiment with friendships while going through a roller coaster of emotions (Bernstein, 2002). Boys and girls will often choose to be negative towards each other to avoid social the awkwardness of their age.

In addition, as these students move through these three years of school they will develop at different rates. As they mature from age eleven to fourteen many will begin puberty creating physical and emotional changes. The emotional changes can cause leaning rates to differ between each of the students (Davis, 2008; Mizell, 2002). Thus as
the minds of adolescents are exposed to different topics and experiences in middle school
their ability to understand, learn, and apply the knowledge varies. (Eccoles & Midgley,

According to Vygotsky’s *Social Development Theory* (1978) of child
development, students learn by interacting with other individuals. Fogarty (1999) stated,
“Vygotsky’s theory suggested that we learn first through person-to-person interactions
and then individually through an internalization process that leads to deep understanding”
(p. 77). For the middle school student to succeed academically both Piaget and
Vygotsky’s theories must coexist in the school (Blake & Pope, 2008; Fogarty, 1999).
Several researchers have suggested that teachers in middle schools must be able to meet
the social and emotional needs of the students, as well as, the cognitive learning needs
(Alexander, 1968; Alexander & Williams, 1968; Blake & Pope, 2008; Erb & Doda, 1996;
Garner, 2008).

Rooser and Eccles (1998) found that adolescent experiences during middle school
can impact their development. In their findings the physical and social changes that
occur during middle school grades have a significant effect on their daily interactions
with other students, teachers, and academic progress. This can lead to a decline in
academic motivation, performance, and social interactions (Eccles & Midgley, 1989;
Rooser & Eccles, 1998; Whitley, Lupart, & Beran, 2007). These developmental stages
and variants are important to the middle school student’s *stage-environment fit theory* as
defined by Eccles and her colleagues (Eccles & Midgley, 1989; Eccles et al., 1993), as
well as by Whitley, Lupart, & Beran (2007).
Gardner’s theory of multiple intelligences suggested that learning and teaching should focus on the particular intelligences of the individual. Gardner’s 1983 definition of intelligence is “the ability to solve problems or to create products that are valued within one or more cultural settings”. Today his definition is very similar, however he describes that people have a biophysical latent ability to capture information that can be used to solve problems (Gardner, 2008). In 1983, Gardner proposed and defined seven separate human intelligences which are most often identified as Gardner’s Multiple Intelligence (Gardner, 2004; Gardner, 2000): (a) linguistic; (b) logical-mathematical; (c) musical; (d) bodily-kinesthetic; (e) spatial; (f) interpersonal; and (g) intrapersonal.

Gardner believed the first two are the most often valued by educators. Linguistics leads to the ability to learn languages and to use language skills to accomplish certain goals. Logical-mathematical gives the learner the ability to carry out mathematical operations and to investigate scientifically. The next three musical, bodily-kinesthetic, and spatial are linked to the arts. The musical is considered by Gardner to be parallel to the linguistic in that it can support the learner’s ability to interpret and compose similar to a linguist’s ability with languages (Gardner, 2000). Bodily kinesthetic and spatial are important to all learners and is key to athletes, surgeons, and crafts persons. The last two interpersonal and intrapersonal are important to both the learner and the educator. The interpersonal denotes a person’s ability to work with others. Intrapersonal allows an individual to recognize his or her own abilities to work within his or her own abilities and limitations (Gardner, 2000).

According to Kearsley (2006), both Gardner’s theories of multiple intelligences as well as Piget’s fourth stage of development, allow students the ability to use higher order
thinking and reasoning skills. Students in middle school are at the age to begin classifying information through physical and logical experiences. Which means students must be able to explore and experience their learning styles to achieve academic and social success (Gardner, 1993; Kearsley, 2006).

The use of interdisciplinary teams could overcome the defense mechanism suggested by Van Hoose, Strahan, and L’Esperance (2001). The defense mechanism is a way that young adolescent students cope with activities that they believe are too difficult or not worth their effort. This leads to students making excuses or comments that are counterproductive or defeatist in nature (Brown, 2008; Van Hoose, Strahan, and L’Esperance, 2001). If educators can work with adolescents to understand their needs and give them opportunities to work towards higher order thinking and reasoning skills through multiple intelligence learning activities they will overcome many of the obstacles of learning (Brown, 2008).

*Individual Centered Education* as defined by Gardner (2004) occurs when educators learn as much about each student through assessments and formative observations. The educators must develop a plan for each student that will optimize the educational experience for each student then use the data to adapt and restructure lessons for the student. Furthermore, by following the educational plan of each individual student it can alleviate frustration and lead towards a more fulfilling educational experience (Gardner, 2004, p. 56) the best way to achieve understanding of a concept “is to draw on all of the intelligences that are relevant to that topic in as many legitimate ways as possible” (Gardner, 2004, p. 60).
Marzano (2000) also threaded his theories within those of Piaget, Vygotsky, and Gardner by giving educational reform his thoughts on exposing students to *Three Systems and The Knowledge Domain* in order to be truly successful. The systems are named Self-System, Metacognitive System, and Cognitive System (Marzano, 2000). The Self System according to Marzano is where the root of all learning occurs. The motivators within this system are *importance, efficacy, and emotions*. Under the self-system the learner must first decide the *importance* of the material being presented or required for them to learn. If he or she believes that the material is necessary to accomplish a goal then time will be invested to learning.

As a student experience successes while accomplishing tasks they are also developing experiences that determine their self *efficacy* strength. The building and maintaining a high level of self efficacy gives learners the ability to take on tasks in a straight forward method. Furthermore, the *emotions* that students express while in the learning environment also impact the motivation and extent of learning. Negative emotions will lead towards lower levels and non-learning experiences. While positive emotions move students towards higher faster learning scenarios (Marzano, 2003; Tedman, 2007). By this process the individual learner determines that factors will stimulate the learning progression.

The Metacognitive System regulates all of the other systems. Students must first determine their goal when given an assignment through the self system. Once that is established he or she must then decide how he or she can meet his or her goal through the cognitive process. Schoenfield’s 1992 research supports that the control and regulation
of the thinking process has a strong impact on achievement (Marzano, 2003; Marzano, Pickering, & Pollock, 2001; Tedman, 2007).

The cognitive system relies on prior learned knowledge that the student can pull upon to help them manipulate processes. Marzano has divided this system down into four subcomponents:

1. **Knowledge Retrieval** – recalling facts, sequences, or processes that have been stored in permanent memory

2. **Comprehension** – information is categorized based on what the learner thinks is important at the time of learning.

3. **Analysis** – learners are able to manipulate what they have learned to create ways to link new programs or topics.

4. **Knowledge Utilization** – learners are able to use their knowledge to make decisions during projects and experiment using past, present, and future events.

As students are exposed to new topics in education each system helps to determine how students will tackle the task. A student operating from the Self-System decides whether he or she will engage in an activity or will continue with current behavior. When students track their progress they set goals through the Metacognitive System. As they process material the Cognitive System synthesized the content that is within the Knowledge Domain. (Marzano, 2000). These processes are important for developing the middle school student.
The Middle School Adolescent

Roeser and Eccles (1998) described the middle school student as an adolescent who has decreasing perceptions of the importance of education and their own self-esteem. Emotionally, socially, and physically middle school students experience tremendous changes all within three years from sixth grade to eighth grade (Bernstein, 2002). They also go through this while in the same building as the opposite sex. This creates its own set of issues as girls begin puberty as early as age nine and as late as age fourteen. Boys on the other hand, start puberty as early as age 12 and as late as age 16. This difference in sexual growth also effects emotional and social growth for both males and females, which then in turn can effect educational achievement (Bernstein, 2002).

An analysis by the Maryland Adolescent Development in Context Study which was first reported by Roeser, Eccles, & Sameroff in 2000, then in 2001 by Van Hoose, Strahan, & L’Esperance, and in 2008 by Brown:

shows that three essential aspects of adolescents’ lives in school contexts shape their views of themselves, their social-emotional functioning and their success in school: 1) how well their experiences support a sense of competence; 2) how well their experiences support a sense of autonomy; and 3) the quality of their relationships with peers and adults (Roeser, Eccles, & Sameroff, 2000; Van Hoose, Strahan, L’Esperance, 2001, p. 48; Brown, 2008, p. 27).

As students move from elementary school to middle school or junior high school they often go through periods of depression and show declines in school motivation and performance (Eccles & Midgley, 1989; Roeser & Eccles, 1998). In addition, these behaviors can lead to increase student truancy or feelings of alienation from school
Studies have reported that emotionally middle grade students have lower self-esteem as they enter into the middle school or junior high school setting. However, as these students progress through seventh and eighth grade they can begin adjusting to the demands of school (Roeser & Eccles, 1998; Whitley, Lupart, & Beran, 2007; Wigfield, Eccles, MacIver, Reuman, & Midgley, 1991; Zanobini & Usai, 2002).

Socially peer groups are important to middle school students and their performance (Wentzel, 1997). In studies of middle school students, the relationships that students make with others can be a determinant to their academic success both in middle school and beyond. During the three years of middle school an adolescent’s mental perception of themselves changes as they move through periods of rapid physical, emotional, and psychological changes. In addition, each individual student goes through these changes at different rates. Some may experience all of the changes in sixth, seventh, or eighth grade or they can occur separately over the three years of middle school (Mizell, 2002; Wentzel, Barry, & Caldwell, 2004).

Historical Background of Middle Schools

According to Moss (1969) the idea of moving students out of the kindergarten through eighth grade elementary schools and out of a nine through twelve high school setting started as early as 1913 when fewer children were needed in factories and the traditional schools at the time were becoming over crowded. The development of the junior high school was another way to educate the students who were not college bound and prevent dropout rates from increasing (Lounsbury & Vars, 2003). These students were placed in a junior high school setting based on their educational needs. Prior to that time period, students attended one of three types of schools: comprehensive schools with
grades Kindergarten through twelfth grades, *beginner schools* including grades Kindergarten through eighth grades, or *high school* comprising grades nine through twelve (Alexander, 1968).

As education became more demanding and specific in the 1930s the idea of a middle grades school for seventh through eighth grade developed. The main purpose of the middle grades school was to prepare adolescent aged students for the academic demands of higher education, including high school (Beane, 1993; Wiles & Bondi, 2001). From 1920 to 1960 the number of junior high schools in the United States grew from 400 to more than 6000 (Moss, 2008). During this period, many educators and government officials decided that the junior high concept of education was not effective due to the adolescent social and emotional needs of these students (Bedard & Do, 2005; Brown, 2008). In addition by moving young adolescents into schools that separated them from other children it allows for teachers to place their energy on the developmental needs of one group of students instead of a range of students in a kindergarten through eighth grade school setting (McEwin, Dickinson, & Jenkins, 2003; Brown, 2008).

It was in 1964, that William Alexander (1968) suggested modifying the junior high school concept by separating the students into three distinct levels of education. Elementary school with grades one through five, middle school grades including grades six through eight, and high school with grades nine through twelve. The goal was to separate the students based on their educational and emotional needs. The middle school idea placed students between the ages of 10 and 14 in the same building and educational environment (McEwin et al., 1996). According to Alexander (1968) this concept would increase student achievement and would also meet the social and emotional needs of the
developing adolescent students. Between the years of 1967 to 2001 school districts picked up on this idea and the number of middle schools grew from 1,101 to approximately 12,000 in the United States (McEwin et al., 1996). At the same time, elementary schools were increasing in population due to an increase in births after World War II and the Vietnam War. Since at this time elementary schools housed either first through sixth grade and most junior high school consisted of seventh and eighth grade, the overcrowding forced many systems to move sixth grade to the seven through eight grade junior high school (Cronin, 2007; Erb, 2006; Flowers, Mertens, & Mulhall, 2000).

The middle school model also isolates students at the early adolescent age which allows schools to focus on the emotional, as well as behavioral needs of the students (Byrnes & Ruby, 2007; Coladarci & Hancock, 2002). With only three grade levels pedagogical strategies, professional development for teachers, and instructional strategies can also be maximized by teachers in order to reach their students learning needs (Byrnes & Ruby, 2007; Hough 2005; Offenberg, 2001).

In comparison of middle and junior high school there are both similarities and differences between two school models. Both have similar subject content and course demands, progress reporting timelines, organizational concepts, and activities. However, differences between the two typically included middle schools having more teachers, teaming increased flexible scheduling, and more standard course offerings (Alexander, 1968; Murata, 2002).

The middle school model at the time allowed teachers to work within one grade level and form teams of core subjects all working with the same age of student. The junior high school model had teachers teaching core subject for multiple grade levels and
often they were grouped with other teachers of their same subject. The middle school model also gave teachers the ability to schedule for students within the same grade level and among themselves. This gave them the flexibility to set course lengths and teaching times to meet the needs of the students assigned to their grade level. In contrast, the junior high teacher had to teach subjects at designated times to make sure they were able to meet the course demands of all the students. The middle school model also allowed the teachers to keep to courses that are more standard because they were able to work with the same students and group of colleagues, whereas the junior high teachers often had to teach various courses to work around grade level requirements and student needs (Alexander 1968; Mizell, 2002).

Beginnings in the late 1990s great strides have been taken in America to increase middle school achievement by emphasizing the characteristics of adolescence and emotional stability of the students during these years of school. Wiles and Bondi described these students as the “least understood, least cared for, and the most fragile in our society” (Wiles & Bondi, 2001, p. 39). According to Erb (2006), the National Forum to Accelerate Middle-Grades Reform has recognized eight middle grade reform models:

1. *Turning Points* (Munoz, Ross, & McDonald, 2007) improved student achievement by providing educational experience for young adolescents that are responsive to their academic, developmental, and social needs (p. 169);

2. *AIM at Middle-Grades Results* (Center, 2005), followed the *Teaching for Understanding* approach by adapting the *Understanding by Design Model of Grant Wiggins and Jay McTighe*;
3. *Different Ways of Knowing* (Munoz et al., 2007) was a multiyear program that builds on the multiple intelligences of students to develop skill in different areas;

4. *Making Middle Grades Work* (Cooney & Lasater, 2006) placed an emphasis on raising student achievement based on a framework of research-based key practices and conditions, continuous improvement through data collection and analysis, and membership in a network of schools that supports improvement;

5. *Middle Start* (Corbet & Wilson, 2006) promoted the academic success of all middle-grades students by providing professional development to meet the needs of adolescents;

6. *Schools to Watch* (Watch, 2010) focused on school improvement and recognition in four domains; academic excellence, developmental responsiveness, social equity, and organizational structure;

7. *Success for All Middle School Program* (Daniels, Madden, Slavin, & Success for All Foundation, 2004) implemented a well-structured curricula, instructional methods, and professional development for teachers to help students reach their full potential (p. 2); and

8. *Talent Development Middle School Model* (Herlihy & Kemple, 2004) designed for severe poverty populations to increase academic achievement by reorganizing schools into smaller learning communities.

Although many of these models address adolescence needs, the more effective models address both the rigor of course work and the emotional growth and stability of the students (Reising, 2003). Of the eight reform models however, *Turning Points* is the most researched and widely implemented (Erb, 2006).
The successful modern middle schools within the United States are a result of many transitions and school reforms over the decades of American education. These schools were originally conceived in the 1960s, over 50 years after the inception of the junior high school model in the year 1909 (Davis, 2008). Although, junior high schools were originally developed to relieve heavily populated suburban high schools due to the onset of more mechanized industrial factories and the compulsory education laws (Moss, 1969), they were also intended to help decrease the dropout rate of students after eighth grade. Over time the junior high school model came under heavy scrutiny for not meeting the emotional, social, educational, and physical needs of students between the ages of eleven and fourteen (Lounsbury, 2009; Lounsbury & Vars, 2003).

Today, even though the middle school concept has been around since the 1960s parents, politicians, and even educators continue to criticize middle schools and their approaches to educating young adolescent students. These schools could be defined as a weak link in American education, whereas in reality they should actually be considered an essential academic tie between the students in elementary school and the students in high school. According to Smith (1985) the middle school model conforms to Piaget’s theories on the cognitive and social interactions of adolescents (DeVries, 1997; Smith, 1985). Students during these three years of education are moving from Piaget’s concrete operations to the formal operations which would give students the ability to learn while remaining in their peer group (Erb, 2006; Sproatt, 1981). More importantly by following Alexander’s original concept of the middle school configuration and the concept of the modern middle school described by Erb in 1999, middle schools should focus on and be a
time for social, emotional, and academic growth of American youth (CCAD, 1989; Davis & Thompson, 2004; Erb, 2006; Erb & Stevenson 1999; Jackson & Davis 2000)

In the early 1960’s many educators and government officials decided that the junior high concept of education was not effective due to the specific adolescent needs of these students. William Alexander, who is considered the father of the American middle school (Davis, 2008; Lounsbury, 2009), suggested modifying the junior high school concept by separating the students into three distinct levels of education (Alexander, 1968). The term middle has also become a descriptor not only for the school but for the students who were in between childhood and adolescent.

Alexander (1968) also stated that the middle school by definition should contain at least three grades and include at least grades six and seven with students between the ages of ten and fourteen in the same building and educational environment (Alexander, 1968; Davis, 2008; Lounsbury, 2009). In addition, the middle school should also cater to the learning needs of young adolescents (Alexander & McEwin, 1989; Cruz, 2003). Overall, the premise of this concept was to separate the students based on their educational, social, and emotional needs (Alexander et al., 1969; Wiles & Bondi, 2001).

According to McEwin et. al. (1996) this grade and age configuration best meets the emotional and social need of young adolescent (McEwin et al., 1996). Furthermore, the movement of junior high school to a middle school model suggested that the junior high school model was ineffective at meeting the needs of students (Davis, 2008).

Between the 1960s and 1980s, much of the middle school reform was slow until 1982 and the release of the position paper by the National Middle School Association (NMSA) This We Believe: Developmentally Responsive Middle Level Schools (NMSA,
1982; NMSA, 2003), middle school educators become more focused on the child-centered concept of the middle school model (Marx & Harris, 2006). This was followed less than a year later by the National Commission on Excellence in Education’s report *A Nation at Risk* (1983), which called for: (a) high standards for academic performance; (b) more rigorous high school graduation requirements; (c) higher teacher salaries; (d) more time devoted to instruction and homework; (e) better students conduct; and (f) higher standards for early entry into the teaching profession. These two reports brought light to the failings of education and to the middle school population of students. During this same time period, the NMSA released ten strategies middle schools should have to be successful: (a) educators knowledgeable about and committed to young adolescents; (b) a balanced curriculum based on student needs; (c) a range of organizational arrangements; (d) varied instructional strategies; (e) a full exploratory program; (f) comprehensive advising and counseling; (g) continuous progress for students; (h) evaluation procedures compatible with nature of young adolescents; (i) cooperative planning; and (j) positive school climate. These papers were also a catalyst for pushing more junior high schools towards the middle school concept (NMSA, 2003).

In 1989 the Carnegie Counsel on Adolescent Development (CCAD) published a position paper *Turning Points: Preparing American Youth for the 21st Century* that highlighted eight major recommendations to improving education for middle school students in their position paper (CCAD, 1989): (a) create small communities for learning; (b) teach a core academic program; (c) ensure success for all students; (d) empower teachers and administrators to make decisions about the experiences of middle grade students; (e) staff middle grade schools with teachers who are expert at teaching; (f)
improve academic performance through fostering the health and the fitness of young adolescents; (g) re-engage families in the education of young adolescents; and (h) connect schools with communities. In addition, this position paper called for the replacing of the junior high school models with the middle school model, thus resulting in schools moving towards a team based middle school concept (Flannery, 2007). In addition to the eight recommendations this paper also placed the middle grades education in the forefront of the education public arena (Cronin, 2007).

Eleven years later, Jackson and Davis (2000), published Turning Points 2000: Educating Adolescents in the 21st Century which analyzed the effects of the Turning Point 1989 report over a ten year period. They found that most of the reform during the time was emphasized on the needs of the student and not the teachers (Cronin, 2007). The 2000 Turning points would then look at making changes to the rigors of the academic standards that were relevant to student needs and how students learn. Ten years later Jackson published New Middle Schools for New Futures that again examined the reform from 1989 as well as that of 2000 (Jackson, 2009). Jackson found that flawed programs and federal mandates like No Child Left Behind have done little for school improvement in middle schools over the past two decades (Jackson, 2009). Additionally, the National Assessment of Educational Progress (NAEP) has shown that eighth grade scores have improved for all groups of students, but there are still significant issues. Thirty percent of eighth grade students are still below basic achievement levels and twenty seven percent are also below proficiency in reading (National Center for Education Statistics, 2007; Center on Education Policy, 2011).
In 2005, Thomas Erb published, *This We Believe in Action* (Erb, 2005) which compared NCLB limited legislation to the whole school experience of middle school concept and young adolescents. It identified that cultural characteristics and school practices that must work together to ensure success for each student. These characteristic elements are as follows:

1. Cultural Characteristics
   i. High expectations;
   ii. Courageous, Collaborative Leadership;
   iii. Active Learning;
   iv. Adult Advocate;
   v. School-Initiated Partnerships;
   vi. Shared Vision;
   vii. Safe Environment; and
   viii. Knowledgeable Educators

2. School Practices
   i. Organizational Structures;
   ii. Multiple Learning and Teaching Approaches;
   iii. Relevant, Challenging, Integrative, Exploratory Curriculum;
   iv. Assessment and Evaluation;
   v. Health, Wellness, and Safety; and
   vi. Guidance and Support.

Each of these practices has its own part in school improvement and school reform of the middle school. The structure of the middle school and how classes are set for students
defines the organization of the programs. The most popular of the middle school model is using interdisciplinary teaming. Another key to student success is how teachers approach the learning environment. All of these elements are important in leading middle school educators towards practices that are related to the recommendations listed in the *Turning Points* papers. Furthermore, these recommendations support one of the main characteristics of the middle school concept: Interdisciplinary Teaming (Cronin, 2007; NMSA, 1995; NMSA, 2002; NMSA, 2003).

Over a five-year period, seventy middle schools participated in the Center for Prevention Research and Development’s (CPRD) School Improvement Self-Study (Flowers et al., 2000). From their study of nearly 2,000 teachers and 23,000 students, the CPRD found that an effective middle school classroom has the following:

1. high levels of academic rigor
2. a curriculum that is meaningful, relevant and connects subject matter
3. opportunities for learning
4. chances to go beyond the boundaries classroom into the community
5. a positive climate that stems from mutual respect and beneficial interactions.

Interdisciplinary Teaming

Even with the daunting data over the past century, the overall focus for improving middle schools was based on the *true middle school concept*. One of the models *Interdisciplinary Teaming* as defined by Alexander placed students with three to five teachers and “into groups that consist of 75 to 120 pupils organized either on a single grade or multi grade” configurations (Alexander, 1995, p 24). This grouping process allowed teachers the ability to work together to get to know the students and to
implement programs that benefit student achievement. This created an environment where students only interacted with others within their group, becoming a family within the school. This model encouraged more interactions between students, teachers, and parents. The middle school concept additionally helped students through emotional, social, and physical maturity as most during this time period are going through puberty (Davis, 2008; Erb & Stevenson, 1999; Northwestern State University, 2003; Walker, 2002). For this model to be successful, teachers must be provided with a common planning time to collaborate lessons and design their daily schedule (Erb & Stevenson, 1999; Murata, 2002; Warren & Payne, 1997). Research does show that there is an association between teaming and student achievement, however it does not suggest, that teaming will automatically increase student achievement (Beane, 2001).

When reviewing interdisciplinary teams in middle schools, the foundation of these programs is relevant to the true success of each school’s implementation (Cronin 2007). There are many different middle school models of teams and each program has specific traits that are unique with the purpose of increasing student achievement. The most common form of interdisciplinary team today consists of two or more teachers working with a common group of students. These teachers are specialist in different subject areas and bring their expertise to the students they commonly teach (Danielson, 2002). According to Erb and Stevenson (1999) there are five principles for organizing effective teams:

1. Keep teams small in terms of number of teachers and students;
2. Provide sufficient individual and team planning time for teachers;
3. Allow teams to design their students’ daily schedule;
4. Assign teams to their own area of the building; and
5. Allow teams to work together for multiple years.

There are many positive aspects of organizing middle schools into interdisciplinary teams. Flowers et al. (2000), found that teams offer a healthy and safe environment for students, can lead to greater student emotional and social stability compared to schools which do not have teams, and that teachers are more able to share and report on student performance. Teaming tends to move teachers away from being isolated when trying to understand the social and emotional needs of students while they go through puberty (Flowers et al., 2000). Furthermore, teams can enable teachers to provide more support to students with various needs and backgrounds while supporting teachers as they face the increasing challenges of educating students (Styron & Nyman, 2008).

According to Beane (2001), schools with organized teams tend to have higher academic achievement when compared to schools without organized teams. This suggested that there may be a relationship between teaming and student achievement, but it does not mean that schools that operate with teams will automatically have higher achievement rates when compared to non-teaming schools (Davis, 2008). In addition there may be a relationship between the how long schools have implemented teams and student achievement. Since 2006, some larger school systems have not seen an increase in academic performance when using team structures and the middle school concept. Budget constraints have been challenging the middle school model due to the additional cost of implementing academic teams.
In Chicago and New York, schools are moving back to kindergarten through eighth grade programs or to programs that have smaller grade grouping to capitalize on more individual settings and to capitalize on the demands of accountability (Weiss & Kipnes, 2006). In a recent study Moss (2008) found that principals surveyed in New York reported that the middle school model could improve student achievement on tests, but at the loss of students participating in exploratory and advisory activities and a loss of engaging curriculum.

Accountability

Within the educational world “‘accountability’ has become the mantra of education reform” (Derthick & Dunn, 2010). With the inception of the federal policy of No Child Left Behind (NCLB) that was signed into law by President George W. Bush on January 8, 2002, schools, school systems, and states have been required to meet the following ten requirements:

1. A single statewide accountability system applied to all public schools and local education agencies.

2. All public schools are included in the State accountability system.

3. A State's definition of AYP is based on expectations for growth in student achievement that includes is continuous and substantial, such that all students are proficient in reading and math no later than 2013-2014.

4. A State makes annual decisions about the achievement of all public schools and local education agencies.

5. All public schools and local education agencies are held accountable for the achievement of all individual subgroups.
6. A State's definition of AYP is based primarily on the State's academic assessments.

7. A State's definition of AYP includes graduation rates for high schools, and additional indicator selected by the State for middle and elementary schools (such as attendance rates).

8. AYP is based on reading/language arts and math achievement objectives.

9. A State's accountability system is statistically valid and reliable.

10. In order for a school to make AYP, a State ensures that at least 95% of students in each subgroup enrolled. Increase the level of student achievement every year with 2013-2014 being a target year for all students to pass the state standards (Paige, 2002).

Each public school, school district, and state is mandated through NCBL to meet defined criteria within the accountability provisions within the NCLB act. These requirements are depicted as Annual Measurable Objectives (AMO) and are based on the percentage of students who meet or exceed the standards through standardized evaluations. The AMOs for each of the three areas increase yearly with the target goal of 100% meets and exceeds by 2014. In Georgia the math AMO for 2007 was 58.3 %; 2011 it was 75.7% and for 2014 it is 100% (U.S. Department of Education, 2007).

Students are evaluated and must meet these requirements for Adequate Yearly Progress (AYP). There are three areas that each school, district, and state must show gains to achieve AYP: test participation, academic performance, and a second indicator (NCLB, 2002; GaDOE, 2008). In Georgia, schools must have a test participation rate of at least 95%. For middle schools it is defined as 95% of all six, seventh, and eighth grade
students must take the CRCT during the state-testing window. Additionally, a percentage of students which is based on the AMO must meet or exceed the standards on the CRCT in Reading and Math.

The second indicator for schools in Georgia is associated with population subgroups. A subgroup is defined as a group of students with at least 40 students who participate in taking the CRCT. Georgia defines these subgroup populations as Asian/Pacific Islander, Black or African American, Hispanic, American Indian or Alaska Native, White, Multi Racial, Students with Disabilities, English Language Learners, and Economically Disadvantaged. Any school which has at least 40 students in any of these subgroups populations has a second indicator. In 2011, only 70.6 % of middle schools in Georgia made AYP, this was down from 78.59% in 2010 (GaDOE, 2012)

Federal funds such as grants, aids, and Title funds are susceptible to schools meeting the measurable standards. It is not uncommon for a school to make AYP, but the district and state the school is located may not make AYP. For schools AYP is based on the students attending that particular school. Districts use data from all schools within the district and percentage rates are averaged. States are similar to districts by all schools and students populations are considered for AYP.

For teachers the emphasis placed on test scores has an impact on their day to day teaching activities as well as the funding their school or system receives (Byrnes & Ruby, 2007). The state of Pennsylvania has proposed tying teacher’s salaries to scores on the test. If a district’s students do poorly, the district’s budget is cut the following year by the state, and the teachers get a pay cut. Critics point out that if a school is doing poorly,
taking funds away from its budget and cutting teachers' salaries will, more likely than not, hamper the ability of the school to improve the following year.

Performance indicators are a part of accountability and are only effective when “(a) schools have to give account, (b) parents are informed more effectively and can challenge schools as regards weakness, (c) the performance indicators can be used by pupils and parents for school choice, and (d) the school can use the performance indicators as benchmark information” (DeWolf & Janssens, 2005, p. 5). Through this process, performance indicators can also impact public perception of the schools which in turn would either enhance the desire to go to the school or create a scenario where parents and students would choose to leave the school for better opportunities. There can also be undesired side effects to education when school performances are reported. These can include: gaming, window dressing, misrepresentation, fraud, and deception (DeWolf & Janssens, 2005).

Most accountability systems are based on yearly assessments using standardized tests such as the CRCT. Schools that fail to meet the basic level of performance can face severe punishments such as reduction of funding, restructuring of staff, and dismissal of administrators (Byrnes & Ruby, 2007). In addition, schools have also seen a higher rate of drop outs in the economically disadvantaged, African Americans, Latinos, and English language learners (McNeil, Coppola, Radigan, & Vasquez, 2008). In their study on the high stakes testing system in Texas, schools which demonstrated gains often did so in direct proportion to the number of low performing students who either left or dropped out. This is a phenomenon that is occurring due to the high pressure placed on schools
and students to perform on high stakes tests that are in turn used as a measure of accountability.

Student Achievement

With the introduction of No Child Left Behind Act (NCLB) in 2001 the essential goal was to improve education and the educational system. The act began holding every teacher, administrator, superintendent, and principal accountable for the education of all children in the United States. NCLB also affected the laws effecting school accreditation thus making student achievement a focus for politicians, parents, and school administrators. This accreditation was referred to as Adequately Yearly Progress (AYP). NCLB (Behind, 2009) require that states demonstrate annual progress in raising the percentage of student proficient in reading and mathematics for all students. Furthermore it expressed that subgroup populations of students must show gains as well. Subgroups are defined as minority populations within a school population. In Georgia these subgroups are designated based on NCLB requirements for AYP reporting. The subgroups are: Asian, Black, Economically Disadvantaged, Hispanic, Special Ed, and White (GaDOE, 2008). NCBL mandates that schools and systems must demonstrate increases in student achievement to meet AYP requirements. In addition states were required to show a narrowing of the gap between advantaged and disadvantaged students. This requirement meant that schools had to show increases for all students regardless of their race, social economic status, or cultural background.

Georgia law, as amended by the A+ Education Act of 2000 required that all students in grades one through eight take the CRCT in the content areas of Reading, English Language Arts, Math (GaDOE, 2011). Students in grades three through eight
were also assessed in Science and Social Studies. The CRCT was implemented in Georgia during the spring of 2000 as a summative end of year assessment in reading, English/language arts, and math for grades four, six, and eight. In 2002, the tests were administered in grades one through eight and continue today.

According to the Georgia Department of Education (2011), the CRCT was designed to measure how well students acquire, learn, and accomplish knowledge and skills set forth in a specific curriculum or unit of instruction. Thus, the CRCT was designed to test how students perform on the Georgia Performance Standards (GPS). This is different than Norm-referenced tests (NRT), such as the Iowa Test of Basic Skills (ITBS), which measure instructional standards commonly taught throughout the entire US. Additionally, the NRTs highlighted differences among students across the achievement curriculum, whereas the CRCT specifically measures student knowledge of state standards. Georgia law also uses the CRCT as a gateway test for grades three, five and eight. Students who passed both the reading and math portions of the CRCT and have passing academic grades in core subject areas are promoted to the next grade level.

Most middle schools are not able to demonstrate whether interdisciplinary teams or the junior high model are responsible for academic success. With the pressures of meeting AYP and moving groups of students forward, schools are seeking strategies to increase student achievement. The task of also meeting the social, emotional, and physical need of students adds to the pressure of middle school teachers and administrators that will keep them on the resistance side of reform programs (Davis, 2008; Mizell, 2002). Engaging students through an intense interdisciplinary team called a pod students should be challenged at high levels thus meeting their learning levels.
Summary

Middle school reform since the 1960s has been a hot topic for many educators, parents, and politicians. Prior to the 1960s there were three main types of schools: comprehensive, elementary, and high school (Alexander, 1968; Brown, 2008; Erb, 2006; McEwin et al., 2003;). The idea to move students to a “middle school” began with Alexander in 1964. Placing students between the ages of eleven and fourteen together away from elementary and high school students allows for educators to meet the unique needs of these students (CCAD, 1989; Davis & Thompson, 2004; Erb, 2006; Erb & Stevenson 1999; Jackson & Davis 2000). In addition, Marzano’s, Piaget’s, Vygotsky’s, and Gardner’s theories of intelligence all support the separation of these young adolescent students.

Though middle schools are able to meet the needs of students through various reform models, interdisciplinary teams have been linked to many of the models and are considered as a key component (Styron & Nyman, 2008). The interdisciplinary pod model within a school is being identified for this study as a more inclusive interdisciplinary team approach.
CHAPTER III

METHODOLOGY

With the convergence of accountability and the imposing mandates of No Child Left Behind (NCLB) Legislation, this study was designed to understand if the middle school concept of interdisciplinary pods had an impact on student achievement in sixth and seventh grade reading, English language arts, and mathematics in suburban middle schools located in the Southeastern region of the United States. This chapter includes descriptions of the research design, a profile of the county and participants in the study, and instrumentation of the study. In addition, the research questions, procedures, limitations, and data analysis are also given in this chapter.

Research Design

This study used a mixed-method approach with a combination of both quantitative and qualitative data. For this study, the independent variable was the type of instructional model used at the middle school level and the dependent variable was student achievement. The qualitative portion of the research was a case study on middle school principals’ perception of the effectiveness of the instructional model used at their school, reasons using the model, and if they would use a different model. This information was obtained through a principal survey (Appendix A). The data was collected once approval had been sought and granted though the Institutional Review Board (IRB) (Appendix B).

Participants

The researcher used the Georgia Department of Education web site to identify 25 potential suburban middle schools to use for this study. The schools were all located within one district and the same curriculum. Additionally, the school district has over
100,000 students enrolled in kindergarten through twelfth grade. To maintain the privacy of the school district and each school participant, the individual school and district were not identified. The district is located in a large suburban area in the southeastern region of the United States and has over 100 elementary, middle, and high schools to serve its students.

Of the 25 middle schools in the district, 23 have a grade configuration of 6 through 8 and two of the schools were from the splitting of one middle school in 2009. These two schools form a 6th grade academy and a 7-8 middle school where all students who attend the 6th grade academy feed into the 7-8 middle school. There is a diverse performance range among the middle schools. Several schools have reached and carry the National Blue Ribbon School of Distinction, many hold the state’s school of excellence status, and there are a few that have not made Adequately Yearly Progress (AYP) as measured by NCLB.

Of the 25 middle schools, 20 principals agreed to respond to the survey and to participate in the study. For these schools student achievement was examined during a four year period from 2008-2011 and the results of the principal survey were reviewed.

Instrumentation

The research design includes both a qualitative and quantitative approach to identify the relationship between student achievement and middle school interdisciplinary pods, interdisciplinary teams, and other middle school models. A survey was developed by the researcher that consisted of four parts. The survey was piloted by 21 professional educators and assistant principals. Cronbach alpha was used to determine the internal consistency of the questions. The pilot survey consisted of 20 questions in Part IV and
after analysis it was determined that eight of the questions demonstrated a statistical correlation. The resulting survey has 8 questions in Part IV with a Cronbach alpha of 0.785 to demonstrate an acceptable internal consistency among the questions. If either or both questions 5 or 8 were removed, a Cronbach alpha of 0.811 would have been obtained (Table 1).

Table 1

*Survey Cronbach Alpha*

<table>
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<td>7</td>
<td>0.767</td>
</tr>
<tr>
<td>8</td>
<td>0.811</td>
</tr>
</tbody>
</table>

The researcher decided to keep both these questions in the survey due of the nature of the questions and the information they would provide to the study. The survey used a Likert scale of 1 – 4 with the following identifiers: 1 – Strongly Disagree, 2 – Disagree, 3 – Agree, and 4 – Strongly Agree (Appendix A).
The survey was given to 20 middle school principals who agreed to participate in the study, to address the principal’s perception regarding the effectiveness of middle school learning programs. Participants rated their perceptions on a 4-point Likert Scale ranging from Strongly Disagree (1) to Strongly Agree (4). Each question was designed to determine a mean and standard deviation. A correlation analysis and moderate multiple regression analysis was used to determine the relationship between student achievement and the instructional model implemented in the middle school. The survey’s design included an opportunity for the participants to provide limited qualitative data by sharing their comments, questions, or concerns in writing. Through this survey the researcher sought to understand the nature of why principals use specific middle school models and if the principal would choose a different instructional model if given the opportunity.

The Georgia Criterion Reference Competency Test (CRCT) achievement data was obtained from the district’s Office of Accountability. The CRCT is a performance-based test administered each year to students in grades 1 through 8 in areas of reading, English language arts, and mathematics; additionally the areas of science and social studies are tested in grades 3 through 8. The exam measures how well students acquire, learn, and accomplish the knowledge and skills outlined in the Georgia Performance Standard. Student scores are based on three performance levels: Does Not Meet Standards scale score of 799 or below; Meets Standards scale score between 800 and 849; and Exceeds Standards scale score 850 and above. Overall, the structural range of scores is from 650 to 900 or above depending on the subject area test.
Student mean scale scores were obtained from each of the school’s reported data that was compiled by the Georgia Department of Education Office of Accountability during the 2008, 2009, 2010, and 2011 school years for each grade in the subjects of reading, English language arts, and mathematics. Data was compared between schools that are implementing a pod model and those that are not implementing a pod model. Schools that implement pod models have a group of students who all have the same four or five core subject teachers. Students do not leave the pod for courses and stay with the same teachers except for exploratory classes. Teachers have a common planning everyday and plan activities for the students within the pod.

Research Questions

This study examined whether there was a difference in student achievement based on either the implementation of interdisciplinary teams, interdisciplinary pods, or other middle school models.

The following research questions guided this study:

1. Is there a difference in between student achievement on CRCT Reading scores and interdisciplinary pods for students in sixth and seventh grade?

2. Is there a difference in between student achievement on CRCT English Language Art scores and interdisciplinary pods for students in sixth and seventh grade?

3. Is there a difference in between student achievement on CRCT Math scores and interdisciplinary pods for students in sixth and seventh grade?
4. Is there a difference in between student achievement and the perception of principals on the benefits of interdisciplinary pods or other middle school instructional models?

Procedures

Approval for this study was given by Office of Accountability of the school district where each of the schools was located and is displayed in Appendix B. The University of Southern Mississippi’s Institutional Review Board (IRB) also approved the study and the approval in displayed as Appendix C. As requested by the school district’s Office of Accountability the middle school principals were notified of the research and an example of the letter is attached as Appendix D. To maintain the confidentiality and privacy of the school district, participating schools, and principals neither the school district nor schools were identified. A code for each school was used to protect their identity. The information provided by the county was entered into the statistical analysis software, SPSS version 18.

This study examined the sixth and seventh grade CRCT mean scores of all students and the proportion of students that meet or exceed standards from 2008 – 2011. The schools were grouped based on the type of instructional model used by the schools during these years. The mean scale score was used for the fact that they are more comparable when looking at changes over a specific time frame and according to the Center on Education Policy (2010), the mean score captures changes at all points of performance. The following data was obtained:

1. Demographic data denoting each school’s total population including percent population of student subgroup.

3. Middle School Principal Survey results which included a question asking the type of learning program implemented and if there are specific criteria that mandates or influences the type of instructional model implemented.

Delimitations

Participants in the study were delimited to 6th and 7th grade middle school students located in a large metropolitan school district in the Southeastern region of the United States. The CRCT tests were limited to reading, English language arts, and math scores for school years 2008-2011.

Data Analysis

Research questions one, two, and three were addressed by comparing student achievement on sixth and seventh grade reading, English language arts, and math CRCT mean scale score for schools using different models. For this study the independent variable was identified as the instructional model (none 6th grade only and 6th and 7th grade) and the dependent variable was student achievement on the reading CRCT, English language arts CRCT, and math CRCT. A Mixed Model Analysis of Variance (ANOVA) was used to determine the impact of instructional model on student achievement.

Research question four was analyzed using a one-way Analysis of Variance (ANOVA) to determine if there was relationship between the instructional model implemented in the middle school and the responses to the questions in Part 4 of the
principal’s survey. Additionally the survey asked principals if they would change the type of instructional model if given the opportunity.

Summary

Chapter III described the research design, participants, instrumentation, research questions, procedures, limitations, and data analysis. The researcher analyzed the impact of instructional models on student achievement and specifically the impact of interdisciplinary pods on student achievement utilizing both quantitative and qualitative data. The CRCT mean scale scores were used over a four-year period to determine the academic impact the instructional model has on student achievement. The Middle School Principal Survey, developed by the researcher, was used to determine each school principal’s perception of the middle school model being employed by their individual school. The results of the study are presented in Chapter IV.
CHAPTER IV
ANALYSIS OF DATA

Introduction

The purpose of this study was to determine if there were differences in assessment scores in Georgia middle schools that implement interdisciplinary pods compared to schools that implement grade level interdisciplinary teams or other middle school learning models. Both student achievement data and middle school principal survey results are reported in this chapter. Twenty three middle schools with a 6-8 grade configuration all within the same school district were invited to participate with eighteen (78%) that agreed to participate in the study. Two additional schools were also asked to participate since in 2008 they were a combined 6-8 middle school and in 2009 they split to form a 6th grade academy and a 7-8 middle school, school 9 and 10 in Table 2. All students who attend school 9 move onto school 10. Based on the information provided by each of the school principals half the schools in 2011 (50%) used an interdisciplinary team model for instructional delivery, 35% used an interdisciplinary pod model, and 15% used a junior high model, as illustrated in Table 2.

Chapter IV was structured around the following research questions:

1. Is there a difference in between student achievement on CRCT Reading scores and interdisciplinary pods for students in sixth and seventh grade?

2. Is there a difference in between student achievement on CRCT English Language Art scores and interdisciplinary pods for students in sixth and seventh grade?
3. Is there a difference in between student achievement on CRCT Math scores and interdisciplinary pods for students in sixth and seventh grade?

4. Is there a difference in between student achievement and the perception of principals on the benefits of interdisciplinary pods or other middle school instructional models?

Descriptive Data

The type of instructional model used by each school was reported in the Middle School Principal’s Survey. The principal’s were given four possible models to choose from: Interdisciplinary Team, Interdisciplinary Pod, Junior High School, and Other instructional model. For purposes of keeping the schools and models connected to the school achievement data, and to protect the privacy and confidentiality of the school and school district, schools have been identified using a numeric system: 1-20. Throughout Chapter IV these numbers are used to keep track of school data. Table 2 illustrates the instructional model reported by each school’s principal on the Middle School Principal Survey.

Table 2

*Middle School Instructional Model by School Year*

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<td>Pod</td>
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<td>Junior High</td>
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Table 2 (continued).

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<td>School Year</td>
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<table>
<thead>
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<th>School</th>
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<tr>
<td>20</td>
<td>Team</td>
<td>Team</td>
<td>Team</td>
<td>Team</td>
</tr>
</tbody>
</table>

It also must be noted that the data obtained was based on the principals answering for the current school year. Informal conversations with each of the principals gave more insight to the model used by each school. Based on these conversations it must be noted that one of the schools used an interdisciplinary team model in 2008 and moved to an interdisciplinary pod model for the school years 2009, 2010, and 2011 and another used an interdisciplinary team model during school year 2008, 2009, and 2010, but moved to a junior high model in 2011. This information was gathered by informal conversations with the principals of these schools.

Student Demographic Data was obtained from the Annual Yearly Progress page of the Georgia Department of Education Website (http://www.gadoe.org/AYP/Pages/default.aspx). Each school’s demographic data was gathered for each of the four testing years under the “Test Participation” section of the web page. The four years of data was then averaged for each school and used to represent the school’s demographics.

For the demographic data, the Georgia Department of Education allows for each student to be reported in only one of six racial subgroups: Asian or Pacific Islander, Black, Hispanic, American Indian or Alaskan, White, or Multi-Racial. In addition to the
racial subgroups, a student can also be placed into one or all of the three remaining subgroups, which is based on specific student traits: Students with Disabilities (SWD), English Language Learners (ELL), and Economically Disadvantaged (ED). All schools have an Asian population under 15%. Three schools have a black population over 55%. One school has a Hispanic population of 43%. Nine of the schools have a white population under 50%. Only one school reported having students in the American Indian and Alaskan subgroup (3%). All schools have at least 11% of their population reported as SWD. Two schools report having an ED of 6% and 7%, whereas, six schools have an ED of at least 64% or higher. Demographics for each individual school and is reported in Table 3.

Table 3

Demographic Data for Each School

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<th>School</th>
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<th>Blk</th>
<th>His</th>
<th>Amr</th>
<th>In</th>
<th>W</th>
<th>Mul</th>
<th>SWD</th>
<th>ELL</th>
<th>ED</th>
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<td>23%</td>
<td>4%</td>
<td>15%</td>
<td>3%</td>
<td>61%</td>
</tr>
</tbody>
</table>

n – total students population reported for the school;
Asn – Asian or Pacific Islander student population;
Blk – Black student population;
His – Hispanic student population;
Amr In – American Indian or Alaskan student population;
W – White student population;
Mul – Multi-Racial student population;
SWD – Students with a reported Disability;
ELL – Students identified as English Language Learners;
ED – Students identified as Economically Disadvantaged;
The county supplied School Performance Summary Reports for both sixth and seventh grade CRCT test results for the 20 schools that agreed to participate in the study. For the purpose of analysis, if schools were on a particular model for more than two years their data was calculated as the model they were on for the majority of the four-year period. School 2 and 18 will be treated as a pod model school. Thus, two schools (10%) reported having a junior high school model, 6 schools (30%) implemented an interdisciplinary pod model, and 12 schools (60%) employed an interdisciplinary team model. To denote the type of model: “J” is used to represent the two junior high schools (School 8 and School 13); “P” is used to represent the six schools that use an interdisciplinary pod model (School 6, School 7, School 10, School 15, School 16, and School 17); and “T” is used to represent the twelve schools that use an interdisciplinary team model (School 1, School 2, School 3, School 4, School 5, School 11, School 12, school 14, School 15, School 18, School 19, and School 20). Upon immediate review there seems to be a difference between models when comparing overall averaged mean scale scores for each model. Table 4 illustrates the descriptive data of each particularly model and the mean scale score by subject.

Table 4

*Combined CRCT Mean Scale Score by Instructional Model*

<table>
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<tr>
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<th>7 Read</th>
<th>6 ELA</th>
<th>7 ELA</th>
<th>6 Math</th>
<th>7 Math</th>
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<td>838</td>
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</table>
In comparing the means of each of the CRCT scores in relation to the model implemented, the two schools using a junior high model had a higher combined mean scale score than schools utilizing either an interdisciplinary pod or an interdisciplinary team. In order to better examine the affect of each of the models a Mixed Model Analysis of Variance (ANOVA) was used with the performance data for each individual school and the model implemented: pod group none, 6th grade only, 6th and 7th grade as a grouping variable, year (2008, 2009, 2010, and 2011), and type of test: reading, English language arts, and math.

Research Question and Hypothesis One

The first research question asked if there was a difference between student achievement on CRCT Reading scores and interdisciplinary pods for students in sixth and seventh grade. The descriptive data for the sixth grade reading measuring academic achievement for the years 2008, 2009, 2010, and 2011 is denoted in Table 5.

Table 5

Sixth Grade Academic Achievement CRCT Reading

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Table 5 (continued).

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<th>2011</th>
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</table>

The descriptive data for the seventh grade reading measuring academic achievement for the years 2008, 2009, 2010, and 2011 is denoted in Table 6.
Table 6

**Seventh Grade Academic Achievement CRCT Reading**

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<th>Mean</th>
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Research Question and Hypothesis Two

The second research questions ask if there is a difference between student achievement on CRCT English language arts scores and interdisciplinary pods for students in sixth and seventh grade. The descriptive data for the sixth grade English language arts measuring academic achievement for the years 2008, 2009, 2010, and 2011 are denoted in Table 7.

Table 7

Sixth Grade Academic Achievement CRCT English Language Arts

<table>
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<tr>
<th>Model</th>
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</table>
The descriptive data for the seventh grade English language arts measuring academic achievement for the years 2008, 2009, 2010, and 2011 is denoted in Table 8.
Table 8

*Seventh Grade Academic Achievement CRCT English Language Arts*

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Research Question and Hypothesis three

The third research questions ask if there is a difference between student achievement on CRCT math scores and interdisciplinary pods for students in sixth and seventh grade. The descriptive data for the sixth grade math measuring academic achievement for the years 2008, 2009, 2010, and 2011 is denoted in Table 9.

Table 9
Sixth Grade Academic Achievement CRCT Math

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Table 9 (continued).

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The descriptive data for the seventh grade math measuring academic achievement for the years 2008, 2009, 2010, and 2011 is denoted in Table 10.

Table 10

*Seventh Grade Academic Achievement CRCT Math*

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Research Question and Hypothesis One, Two, and Three

In order to determine differences in reading, English language arts, and math CRCT scores as a function of instructional model, a 3 x 3 x 4 x 2 Mixed Model ANOVA was conducted with school CRCT subject scores (reading, English language arts, and math), school year (2008, 2009, 2010, and 2011), and grade (6, 7) as repeated measures variables and instructional model as a grouping variable. Results indicated no main effect of instructional model or any interactions of instructional model with any other variables. There were no main effects of subject area or grade and no interactions of those variables. Thus for hypothesis one, two, and three, there were no statistically significant differences between group means for either instructional model used, subject area, or year.

Because only two schools used the Jr. High model and those two schools had a low percentage of economically disadvantaged students (11%, 13%), another mixed
model ANOVA was conducted without those two schools and covarying SES to statistically equate schools on that variable. There were no differences in significant effects that varied from the previous model. Only the covariate SES was significant, $F(1,14) = 18.39, p = .001$.

Research Question and Hypothesis Four

The fourth research question asked if the perception of principals comparing the benefits of interdisciplinary pods or other middle school instructional models relates to students achievement. The Middle School Principal Survey was divided into four sections. Part I obtained descriptive data about the principal and school. Part II was designed to find out the type of instructional model each school implemented. Part III asked principals about teaching assignments within the school. Part IV was created to get more insight to the reasons why a school leader would choose a particular model over another. The results of each question have been tabulated and will be presented.

Part I

Based on the 20 principals who answered the survey, 50% had between 1 and 5 years of experience as a principal, 25% had 6 – 10 years of experience as a principal, and the remaining 40% had over 11 years of experience as a principal. Figure 1 depicts the years of experience for principals who answered the survey.
Part II

Of the 20 schools, 55% reported having teachers teach only one grade level and 45% reported that teachers teach more than one grade level, Figure 2. In addition, based on the instructional model, 7 (58%) of the twelve interdisciplinary team schools reported that some of the teachers within their schools must teach more than one core subject during the day. Only 1 (17%) of the six schools on the pod model reported that teachers had to teach more than one core subject during the day.
Part III

It was important to the researcher to get information about how each principal chooses the type of instructional model for their schools. Each of the eight questions and a summary of their responses are included in this section. The responses are divided into two different groups to compare the responses of principals who implement interdisciplinary pods and the responses of those who use a different instructional model.

**Question 1. It is very important that professional development opportunities about the unique characteristics of middle school adolescent students are offered to your teachers:**  
$F(1, 18) = .797, p = .384$. Of the six *Pod* model schools 50% agreed and 50% strongly agreed. Of the fourteen *Other* model schools 29% agreed and 71% strongly agreed based on the Likert scale used. This is depicted in Figure 3.

![Figure 2. Percent of Teachers Who Teach More Than One Core Subject.](image-url)
Figure 3. Principal Responses to Question 1.

Question 2. It is very important that special education teachers are considered a part of the interdisciplinary team or interdisciplinary pod: $F(1, 18) = .017, p = .898$.

Of the six Pod model schools 17% agreed and 83% strongly agreed. Of the fourteen Other model schools 14% agreed and 86% strongly agreed based on the Likert scale used. This is depicted in Figure 4.

Figure 4. Principal Responses to Question 2.
Question 3. It is very important that middle school students are provided time within the school day for social interactions: $F(1, 18) = .043, p = .838$. Of the six Pod model schools 50% agreed and 50% strongly agreed. Of the fourteen Other model schools 10% disagreed, 28% agreed and 56% strongly agreed based on the Likert scale used. This is depicted in Figure 5.

Figure 5. Principal Responses to Question 3.

Question 4. Budget Constrants Dictate the type of middle school model used at my school: $F(1, 18) = .327, p = .574$. Of the six Pod model schools 50% agreed and 50% strongly agreed. Of the fourteen Other model schools 35% agreed and 65% strongly agreed based on the Likert scale used. This is depicted in Figure 6.
Figure 6. Principal Responses to Question 4.

Question 5. Teacher allotments dictate the type of middle school model used at my school: F(1, 18) = .290, p = .597. Of the six Pod model schools 17% agreed and 83% strongly agreed. Of the fourteen Other model schools 28% agreed and 72% strongly agreed based on the Likert scale used. This is depicted in Figure 7.

Figure 7. Principal Responses to Question 5.
Question 6. State rules on class size dictate the type of middle school model used at my school: $F(1, 18) = .021$, $p = .887$. Of the six Pod model schools 67% agreed and 33% strongly agreed. Of the fourteen Other model schools 14% disagreed, 43% agreed, and 43% strongly agreed based on the Likert scale used. This is depicted in Figure 8.

![Figure 8. Principal Responses to Question 6.](image)

Question 7. Special programs such as special education or gifted dictate the type of middle school model used at my school: $F(1, 18) = .364$, $p = .554$. Of the six Pod model schools 17% disagreed, 50% agreed, and 33% strongly agreed. Of the fourteen Other model schools 7% strongly disagreed, 14% disagreed, 58% agreed, and 21% strongly agreed based on the Likert scale used. This is depicted in Figure 9.
**Figure 9.** Principal Responses to Question 7.

**Question 8.** Research based practices dictate the type of middle school model used at my school $F(1, 18) = .785$, $p = .387$. Of the six Pod model schools 50% disagreed and 50 agreed. Of the fourteen Other model schools 35% disagreed, 50% agreed, and 15% strongly agreed based on the Likert scale used. This is depicted in Figure 10.

**Figure 10.** Principal Responses to Question 8.
When comparing each of the schools individual responses to the questions there are several differences that are unique for each school which is depicted in Table 11. For the schools using the Interdisciplinary Pod, two schools either agreed or strongly agreed with every question and four schools agreed or strongly agreed on every question except three: 3, 7, and 8. For these questions one school disagreed with question 3, one school disagreed with question 7, and two schools disagreed with question 8. No pod school disagreed on more than one question.

The junior high school model schools either agreed or strongly agreed with every question with the exception of question 7. One school strongly agreed and the other disagreed. For the schools using Interdisciplinary Teams, six schools either agreed or strongly agreed with every question and seven schools disagreed or strongly disagreed with four questions: 3, 6, 7, and 8. For these questions one school disagreed with question 3, one school disagreed with question 6, one school disagreed and one school strongly disagreed with question 7, and five schools disagreed with question 8. There were two schools that disagreed on more than one question.

Table 11

*Principal Responses to Middle School Principal Survey Based on Instructional Model*

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Table 11 (continued).

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</table>

P – Interdisciplinary Pod; SA – Strongly Agree; SD – Strongly Disagree
J – Junior High Model; A – Agree;
T – Interdisciplinary Team Model; D – Disagree;
Examination of the principal responses to the eight questions confirmed there is a definite agreement among the principals for questions 1, 2, 4, and 5 regardless of the type of instructional model being offered. Only two principals thought middle school students should not be given social time during the school day and these were using either an interdisciplinary pod or interdisciplinary team mode. Two principals using the interdisciplinary team model did not think that class size affected the type of model they used. Four principals, one from the junior high model, one from the pod model, and two from the team model, thought that special programs did not dictate the type of instructional model. Eight of the principals did not agree that research based practices should dictate the instructional model. Only the junior high model as a group agreed that research based practices should be a factor.

In the survey there were four more questions asked in Part IV that were strictly seeking the opinion of principals. Each of the questions asked if the principal would choose either an interdisciplinary team model, interdisciplinary pod model, a junior high model, or other model if given the opportunity. Only one principal said they would use a junior high school model if given the opportunity. That same school currently is implementing the junior high school model. Of the other 19 school principals, three said they would not use an interdisciplinary team or pod model if given the opportunity and only two school principals would change to another type of middle school model if given the opportunity. These two schools both currently use an interdisciplinary team model. In addition, when these two school principals were asked if they would move to an interdisciplinary pod model, both strongly agreed.
Table 12

*Principal Responses to Model Implementation Preference*

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<th>Interdisciplinary Pods</th>
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Summary

This study was designed to investigate if there was a significant difference in assessment scores in Georgia middle schools that implement interdisciplinary pods compared to schools that implement grade level interdisciplinary teams or other middle school learning models. Both student achievement data and middle school principal survey results were reported in this chapter. The data and analysis of data showed that there was no significant difference in student achievement for any grade level and there was no significant difference in student achievement based on principal preference of...
middle school model. Chapter V provides interpretation of the findings, conclusion, and discussion of the information, as well as, recommendations for future studies.
CHAPTER V
CONCLUSIONS

Summary

The purpose of this study was to understand if the middle school concept of interdisciplinary pods had an impact on student achievement in sixth and seventh grade reading, English language arts, and mathematics as measured by the Georgia Criterion Reference Competency Test (CRCT) in suburban Georgia middle schools. The study examined the achievement mean scale scores for all sixth and seventh grade students at 20 schools in a large school district, for the school years 2008-2011. Additionally, this study investigated the perception of principals on the implementation of middle school models within the 20 schools. The ultimate goal of this study was to provide evidence to middle school principals and school district leaders to support decisions regarding instructional models used within middle schools to support or increase student achievement.

Research Questions

Discussion of Research Questions 1, 2, and 3

Research questions one, two, and three, were designed to examine the effect of the instructional model on student achievement in reading, English language arts, and math. To address these questions CRCT data over a four-year period were examined using a Mixed Model ANOVA. The subject area scores were tested against the instructional model and grade level. Based on the results as presented in Chapter IV, it was determined that there were no significant difference in mean scale scores between
group means for either instructional model used by the school, subject area tested, grade level, or school year.

The researcher had hypothesized that schools using an interdisciplinary pod instructional model would have higher achievement scores than schools that used other middle school models. This was based on the notion that these types of schools would be able to meet all of the social, emotional, and academic needs of young adolescent students. Since the pod model groups students with two to five teachers and keeps them in one geographic location within the school, teachers are able to give student more attention. In addition, students are also able to form a more cohesive unit within the school, thus allowing them to make friends easier and increase their confidence and self-esteem within their peer groups.

According to Gregory (2009), students who are able to stay in smaller groups perform higher on standardize tests and have an enhanced middle school experience. Additionally, McEwin and Greene (2009) also recommended that an interdisciplinary team that consists of two to four teachers should be used for increasing student achievement; this is similar to how a true interdisciplinary pod is set up within a school.

Research question four asked if there a difference between student achievement and the perception of principals on the benefits of interdisciplinary pods or other middle school instructional models. After examining the data it was found that there was no significant difference between student achievement and the perception of principals on the benefits of interdisciplinary pods or other middle school instructional models. Thus, null hypothesis four was rejected.
Limitations

This study was limited to a large school district located in the Southeastern region of the United States to make sure that all schools utilized the same policies, curriculum, and measures of accountability. The findings may not be generalized to other school districts or states that offer different curriculum, standards, or assessments. With the findings being limited to sixth and seventh grade CRCT, it cannot be determined if there would be similar findings in eighth grade or at other schools which do not implement the CRCT.

Another limitation that this study did not consider was if there was a change in the instructional model during the four-year period of CRCT achievement data. Each school principal was asked in the survey which instructional model was being implemented at his or her school. It was assumed by the researcher that this model was utilized during the four-year period that the data was reviewed. Although the assumption was made schools could have utilized more than one instructional model, which could possibly result in changes in the assessment data that was reported.

The study did not interview teachers at each of the schools to get their opinion of the instructional model. In a study by Davis (2008), it was revealed that teachers must work with administrators in a collaborative manner to maximize student achievement. By not interviewing teachers during this study, the researcher only received one level of qualitative data.

Discussion

This research study was conducted during the winter and spring semesters of the 2011 and 2012 school year. The test data utilized for the study was collected from the
2008, 2009, 2010, and 2011 administration of the Georgia Criterion Reference Competency Test (CRCT). The subject and grade levels assessments that were examined were the sixth and seventh grade reading, English language arts, and math. The schools that were selected for the study all reside within one large school district located in the Southeastern region of the United States. These schools also have a 6-8 grade configuration and use a common curriculum. Within the district, there were 25 middle schools and 23 had the specific grade configuration, two of the schools were the result of one school being split into a sixth grade academy and a 7-8 middle school. Although these two schools are not in one building all students from the sixth grade academy move to the 7-8 school and both schools are counted as one unit.

Of the 25 schools, 20 agreed to participate in the study and data was gathered and analyzed for each of these schools. Of the 20 schools, 2 (10%) implemented a junior high school model, 6 (30%) implemented an interdisciplinary pod model, and 12 (60%) implemented an interdisciplinary team model for instruction. Thus, a comparison was made between these three instructional models, student achievement, and between schools that implemented an interdisciplinary pod model and those that did not. In addition, principals from each of the 20 schools were asked to complete a Middle School Principal survey. This survey included questions regarding limitations that may affect the type of model schools use, as well as, preferences as to the type of model their schools would use if given a choice.

Each research question and hypothesis was tested to determine if there were any statistically significant differences between student achievement and instructional models implemented or principal perceptions. As reported in Chapter IV there was no significant
difference in student achievement in either the sixth or the seventh grade or between grade levels. All three-subject areas and all three instructional models were compared for all four school years.

This study differed from the finding of Davis (2008) who had statistically significant differences in seventh grade student achievement on the Mississippi Curriculum Test when middle school models were utilized. In this study, there was no difference between middle school models, including the junior high school model, which is not considered one of the accepted types of middle school models (Cronin, 2007; Flowers et al., 1999; Flowers et al., 2000). In addition, the study completed by Flowers et al. (1999) found that interdisciplinary teaming was more effective than other models if common planning was present. Since all twenty schools have common planning, no matter what model they implement this could be a solid reason for there not being a difference between instructional models and student achievement.

Furthermore, through informal conversations and reviewing each school’s web page it was determined that each of the schools offered programs outside of the normal class requirements that were designed to increase student achievement. These included before and after school tutoring programs, Saturday school, and remediation programs offered during school hours for students who were identified as low achieving. This may cause a lack of fidelity between the schools and instructional programs. This could lead to a compromise in the overall achievement data between schools.

Moss (2008) found that in New York when middle school models are implemented properly, students tend to do better than schools that implement junior high school models or middle school models without proper implementation of the concepts.
In a study by Wallace (2007), schools that worked on social interactions among their students on interdisciplinary teams, demonstrated high social interactions, which in his opinion could lead to high levels of students achievement. The use of interdisciplinary pods instead of teams based on this study’s definition would increase the social interactions of students even more and should have lead to higher levels of achievement on standardized tests. In addition, based on Turning Points 2000 (Jackson & Davis, 2000), teams with fewer members and fewer student transitions can increase student social interactions and thus achievement.

The impetus of this research began in 2008 when schools in Georgia were being faced with losses in teacher allotments. These loses were due to a downward turn in the economy. My colleagues and I began discussing how to implement the middle school concepts while still maintaining the identity of the middle school. The idea of a pod was not new to many of the principals since most of the schools were physically set up in a modular or pod configuration. Although principals were implementing an interdisciplinary team approach, they wanted their schools to have more teacher student interactions and have students groups with only four to five teachers within a grade level. In conducting this research, the hope was to refine the middle school interdisciplinary team into an interdisciplinary pod.

The hope of this study was to prove that interdisciplinary teams were more effective than either the interdisciplinary team or junior high concept. There may be many contributing factors for them being the same. One major factor may be the No Child Left Behind Act. Since all schools have to meet Annually Yearly Progress (AYP), schools are pulling out all resources to get students to the achievement levels that are
defined by AYP and the Annual Measurement Objectives (AMO). This could mean that models that may not have been successful before are showing success because teachers and administrators are having to increase learning opportunities for students.

Recommendation for Policy and Practice

This study has garnered relevant information that is pertinent to the future education of middle school students. The results of this study may disagree with other studies in the fact that there were no differences found in achievement among the different instructional models. However, the purpose and the history of middle school education, as well as, the policies affecting these schools need to be revisited and sometimes revised.

The Georgia Middle School Assurance policy requires that middle schools meet certain criteria in order to receive funding. Although this policy has helped maintain certain aspects of the middle school concept, principals and district leaders may be hindered by the actual policy itself. More specifically, the policy requires that schools maintain a certain number of academic minutes. It does not take into account the social aspects of middle school students. Only 10% of the principals disagreed to offering social time to the school day for middle school students. By revising the policy to include social times it may increase the positive emotional and social interactions among the students. This may possibly lead to higher performance levels (Erb, 2006; Erb & Stevenson, 1999; Flowers et al., 2003; Gregory, 2008).

In addition, 100% of the middle school principals who participated in this study either agreed or strongly agreed that budget constraints and teacher allotments dictated the type of instructional model used at their schools. Currently, teacher allotments in
Georgia are based on the total number of students within a school divided by a set class size limit. Over the past several years this number has risen from an average of 25 to 32 currently. A school that has 1000 students three years ago would have 40 teachers to staff a school. Today that same school would only have 30 teachers. The loss of ten teachers can affect the instructional model being offered at a school. In middle schools, staffing should be based on the instructional model. State and district leaders should keep this in mind when making allotments to schools.

In order for middle schools to truly be effective instructional facilities, state, district, and school leaders must embrace the full middle school concept and student. Policies that affect these schools need to be more closely examined and monitored as we move forward. With NCLB and the introduction of the Common Core, it is more pertinent than ever that schools and districts employ the middle school concept.

Conclusion

The central purpose of this study was to see if interdisciplinary pods had a higher impact on student achievement than other middle school models. It was my hypothesis that by implementing interdisciplinary pods schools would see higher measurable achievement scale scores on the CRCT when compared to schools that implemented other middle school models. Additionally, my hypothesis was that middle school principals would want to move to interdisciplinary pods if given the resources or opportunity. With no difference between the models, other factors of fidelity might be influencing the achievement data.

There is a need to understand the impact of the middle school instructional model on students since accountability is placed on school leaders to meet AMOs and AYP.
This includes understanding the impact of middle school on student achievement after middle school. With the social and emotional needs of students being met in the middle schools (Cronin, 2007; Erb, 2006; Flowers et al., 2003), a study on how a given instructional model may affect the future educational experiences of students could benefit school and district leaders. More specifically evaluating the type of middle school model and a student’s overall achievement and social interaction in high school or post secondary school could lead education professionals to determine the true success of a particular middle school model over another. Thus, a longitudinal study of students who were exposed to various models in middle school and their progress in high school would have significant impact on educational leaders.

Staffing middle schools was also a concern for many principals. Being able to meet the needs of students emotionally and socially as well as meeting all of the academic requirements may have an impact on the type of middle school model offered. 100% of all principals in the study agreed or strongly agreed that budget constraints and teacher allotments have an effect on the type of middle school model they offer. A cost analysis of implementing various models in the middle school setting would also benefit school and district leaders if there is no academic difference between the different models.

In addition, since there were no significant differences between instructional models and student achievement, and these findings were based on the perception of principals and mean student scale scores on the CRCT, interviewing teachers to get their perceptions, could gain more insight to the specifics of models that may be more effective than the ones explored within this study. Additionally, there may be
instructional programs that are being implemented within the models that are similar
from school to school. Analysis of these programs may demonstrate that teaching
practices may be the contributing factor to student success and not a particular school
wide instructional model.

Although many researchers and experts on the middle school concept have said
that middle school models are better than junior high school models, they have also stated
that concepts of the middle school model are the most important component (Alexander,
1968; Bedard & Do, Brown, 20082005; Erb, 2006; Flowers et al., 2003; Lee & Smith,
1993; Lounsbury, 2009; Lounsbury & Vars, 2003; McEwin & Greene, 2009; Moss, 2008;
Sproatt, 1981; Wiles & Bondi, 2001). School leaders should focus on these concepts and
not just a model. This could lead to greater gains in student achievement, social
interactions, and emotional growth for students, since many believe that middle school
grade levels are a difficult time for students. By focusing on these students’ overall
growth and not just their academic growth, we should see higher gains in all middle aged
adolescent students.

Recommendations for Future Studies

Although this study focused on the relationship between student achievement and
instructional models in middle schools, the following are recommendations for future
research:

1. To expand the study to other districts that are similar in size and use the same
   standardized tests such as the CRCT.
2. To invite teachers to complete the survey and examine if their responses are similar to the perception of principals on the effectiveness of the instructional models.

3. To study the achievement data of high school students in order to identify if there is an academic or social impact on student achievement based on specific middle school instructional model.

4. To analyze the specific cost effects of implementing each middle school model to determine if there is an economic impact in gaining specific levels of student achievement.

These recommendations for future study are proposed to help future leaders in education understand the impact of educating middle school aged students. Principals, superintendents, and state educational leaders all impact the outcome of our future students. With the advancement of technology and the new common core curriculum, it is important that educators keep pace with our students and their needs. Middle school students are an exceptional group of adolescents and their development emotionally, socially, and academically during the ages of 11 and 14 is key to their success.
APPENDIX A

MIDDLE SCHOOL MODEL PRINCIPAL SURVEY

Your participation in this survey is greatly appreciated. The purpose of the survey is to determine the type of middle school teaching model used and your perception of the model. All responses will be kept confidential and only aggregate data will be used for research purposes.

Part I. Demographic Data  (Please circle correct response)

<table>
<thead>
<tr>
<th>Number of Years in Education:</th>
<th>1-5</th>
<th>6-10</th>
<th>10-15</th>
<th>16-20</th>
<th>21-25</th>
<th>26-40</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Years as an Administrator:</td>
<td>1-5</td>
<td>6-10</td>
<td>10-15</td>
<td>16-20</td>
<td>21-25</td>
<td>26-40</td>
</tr>
<tr>
<td>Number of Years as a Principal:</td>
<td>1-5</td>
<td>6-10</td>
<td>10-15</td>
<td>16-20</td>
<td>21-25</td>
<td>26-40</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Highest Level of Education:</th>
<th>Masters</th>
<th>Specialist</th>
<th>Doctorate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Approximate number of students in your building:</td>
<td>500-700</td>
<td>701-900</td>
<td>901-1100</td>
</tr>
<tr>
<td>Approximate number of teachers in your building:</td>
<td>21-30</td>
<td>31-40</td>
<td>41-50</td>
</tr>
</tbody>
</table>

Part II. Please check the type of instructional delivery model used by your school:

- **Interdisciplinary Team**: Consists of two to ten core academic teachers who share the responsibility and accountability for planning and teaching a common group or grade level of students (Georgia Department of Education, 2007).

- **Interdisciplinary Pod**: Consists of four or five core academic teachers who share the responsibility and accountability for planning and teaching a common group or grade level of students with less than five percent of students who move to another pod or team during the academic portion of the school day (Bristow, 2011).

- **Junior High School Model**: A school that has a grade six to eight configuration with academic disciplines departmentalized with a focus on content (Georgia Department of Education, 2007).

- **Other Middle School Model**: ____________________________

Part III. Please respond by checking in the “Yes”, “No”, or “Not Applicable” (NA) box to the following statements:

<table>
<thead>
<tr>
<th></th>
<th>Yes</th>
<th>No</th>
<th>N/A</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Teachers at my school have common planning daily.</td>
<td></td>
<td></td>
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<tr>
<td>2. Core subject teachers at my school only teach one grade level.</td>
<td></td>
<td></td>
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<tr>
<td>3. Students at my school remain in the same area for all core subjects.</td>
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</table>
Part IV. Please indicate the extent to which you agree with each statement below by circling one of the responses.

<table>
<thead>
<tr>
<th>1 = Strongly Disagree</th>
<th>2 = Disagree</th>
<th>3 = Agree</th>
<th>4 = Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>It is very important that professional development opportunities about the unique characteristics of middle school adolescent students are offered to your teachers.</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>2.</td>
<td>It is very important that special education teachers are considered a part of the interdisciplinary team or interdisciplinary pod.</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>3.</td>
<td>It is very important that middle school students are provided time within the school day for social interactions.</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>4.</td>
<td>Budget constraints dictate the type of middle school model used at my school.</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>5.</td>
<td>Teacher allotments dictate the type of middle school model used at my school.</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>6.</td>
<td>State rules on class size dictate the type of middle school model used at my school.</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>7.</td>
<td>Specific programs such as special education or gifted dictate the type of middle school model used at my school.</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>8.</td>
<td>Research based practices dictate the type of middle school model used at my school.</td>
<td>1</td>
<td>2</td>
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1. If given the opportunity my school would use Interdisciplinary Teams. | 1 | 2 | 3 | 4 |
2. If given the opportunity my school would use Interdisciplinary Pods. | 1 | 2 | 3 | 4 |
3. If given the opportunity my school would use a Junior High School Model. | 1 | 2 | 3 | 4 |
4. If given the opportunity my school would use another Middle School Model. | 1 | 2 | 3 | 4 |

Your feedback is valuable and appreciated. Please use the space below or on the back of this survey if you wish to make additional comments.

Please return the survey in the enclosed postage-paid envelope to the following address:
Andy Bristow
473 Gaillardia Way
Acworth, Georgia 30102

THANK YOU FOR YOUR TIME AND PARTICIPATION
APPENDIX B

SCHOOL DISTRICT APPROVAL TO CONDUCT RESEARCH

A Community with a Passion for Learning

March 30, 2012

Mr. Andrew L. Bristow
473 Gaillardia Way
Acworth, GA 30102

Dear Mr. Bristow:

Your research project titled, An Analysis of the Impact of Implementing Interdisciplinary Pods on Student Achievement in Georgia Middle Schools, has been approved. Listed below are the schools where approval to conduct the research is complete. Please work with the school administrator to schedule administration of instruments or conduct interviews.

School
School
School
Middle School
School
Middle School
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Middle School
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Middle School
School
Middle School
School

Should modifications or changes in research procedures become necessary during the research project, changes must be submitted in writing to the Academic Division prior to implementation. At the conclusion of your research project, you are expected to submit a copy of your results to this office. Results cannot reference the Cobb County School District or any District schools or departments.

Research files are not considered complete until results are received. If you have any questions regarding the process, contact our office at 770-426-3407.

Sincerely,

Dr. Judith A. Jones
Chief Academic Officer
NOTICE OF COMMITTEE ACTION

The project has been reviewed by The University of Southern Mississippi Institutional Review Board in accordance with Federal Drug Administration regulations (21 CFR 26, 111), Department of Health and Human Services (45 CFR Part 46), and university guidelines to ensure adherence to the following criteria:

- The risks to subjects are minimized.
- The risks to subjects are reasonable in relation to the anticipated benefits.
- The selection of subjects is equitable.
- Informed consent is adequate and appropriately documented.
- Where appropriate, the research plan makes adequate provisions for monitoring the data collected to ensure the safety of the subjects.
- Where appropriate, there are adequate provisions to protect the privacy of subjects and to maintain the confidentiality of all data.
- Appropriate additional safeguards have been included to protect vulnerable subjects.
- Any unanticipated, serious, or continuing problems encountered regarding risks to subjects must be reported immediately, but not later than 10 days following the event. This should be reported to the IRB Office via the “Adverse Effect Report Form”.
- If approved, the maximum period of approval is limited to twelve months. Projects that exceed this period must submit an application for renewal or continuation.

PROTOCOL NUMBER: 12021401
PROJECT TITLE: An Analysis of the Impact of Implementing Interdisciplinary Pods on Student Achievement in Georgia Middle Schools
PROJECT TYPE: Dissertation
RESEARCHER/S: Andrew L. Bristow
COLLEGE/DIVISION: College of Education & Psychology
DEPARTMENT: Educational Leadership and School Counseling
FUNDING AGENCY: N/A
IRB COMMITTEE ACTION: Expedited Review Approval
PERIOD OF PROJECT APPROVAL: 02/23/2012 to 02/22/2013

Lawrence A. Hosman, Ph.D.
Institutional Review Board Chair
APPENDIX D

NOTIFICATION LETTER TO MIDDLE SCHOOL PRINCIPALS

March 1, 2012

Dear REDACTED,

As a middle school principal you are faced with the task of scheduling your building to meet the needs of your students. Over the years as the reduction of budgets have caused reduction of staff within your building scheduling has become more and more difficult. In addition, there are certain criteria that still must be met based on the Georgia Middle School Assurance set by the Georgia Department of Education. With these challenges facing you, as well as, the claims of certain middle school models being more successful than others, it is important to examine the types of models used to determine if there is an impact on student achievement.

This letter serves as notification that sixth and seventh grade reading, English language arts, and math CRCT scores will be examined for the years 2008 – 2011. These tests scores will be obtained from the county’s School Performance Summary Report issued by the Georgia Department of Education. By analyzing the data over the four-year period, the question of whether student achievement is effected by the instructional delivery model will be answered. This study will also answer the question if there is a preference of middle school model and if there are limitations that may necessitate one type of model over another. To maintain the privacy of the school district and each school participant, the individual school and district will not be identified and the county will be identified as a Metropolitan School District in Southeastern United States.

This project has been review and approved by the Human Subjects Protection Review Committee to ensure that projects involving human subjects follows federal guidelines and regulations. Any questions or concerns about the right as a research subject should be directed to the chair of the Institutional Review Board at the University of Southern Mississippi, 118 College Drive #5147, Hattiesburg, MS 39406-0001, (601)266-6820.

Your signature on the attached page (APPENDIX D) indicates that you have read the information provided and understand that your school’s sixth and seventh grade reading, English language arts, and math CRCT scores for the years 2008 – 2011 will be examined. In addition you are agreeing to complete the Middle School Principal Survey that includes questions asking the type of instructional model being implemented at your school and your opinion about the model. If further information is needed regarding this research and survey request, you can contact Andy Bristow at REDACTED or at REDACTED. Thank you for your cooperation in this study.

Sincerely

Andy Bristow
APPENDIX E

PRINCIPAL AGREEMENT TO PARTICIPATE

[District]

Principal Agreement to Participate Form

I have reviewed the Application for Research Project entitled “An Analysis of the Impact of Implementing Interdisciplinary Pods and an Inclusive Foreign Language Program on Student Achievement in Georgia Middle Schools” by Andrew L. Bristow and agree that our school will participate, subject to the researcher’s compliance with district policies and procedures.

<table>
<thead>
<tr>
<th>Principal Signature</th>
<th>School Name</th>
<th>Date of Approval</th>
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The completed, original form should be returned to [Name] in the Academic Division. Upon successful completion of this form, final approval will be provided to the researcher in writing.
REFERENCES


National Middle School Association. (1995). *This we believe: Developmentally responsive middle level schools*. Columbus, OH: NMSA.


U. S. Department of Education. (2007). *State and local implementation of the no child
left behind act, volume III - Accountability under NCLB: Interim report.* Office
of Planning, Evaluation and Policy Development. Washington, DC: Policy and
Program Studies Service.

admins/lead/account/stateplans03/gacsa.pdf

adolescent development and school practices. Westerville, OH: National Middle
School Association.

Cambridge, MA: Harvard University Press.


Wallace, J. J. (2007). Effects of interdisciplinary teaching team configuration upon the
social bonding of middle school students. *Online Research in Middle Level

efficacy and environmental perceptions. *The Journal of Educational Research,
90*(5), 301-08.

http://www.schoolstowatch.org/


