COMPARISON OF FIFTH-GRADE STUDENTS' MATHEMATICS ACHIEVEMENT AS EVIDENCED BY GEORGIA'S CRITERION-REFERENCED COMPETENCY TEST: TRADITIONAL AND DEPARTMENTALIZED SETTINGS

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Marcia Wright Williams

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Comparison of Fifth-Grade Students' Mathematics Achievement as Evidenced by Georgia's Criterion-Referenced Competency Test: Traditional and Departmentalized Settings

by Marcia Wright Williams

APPROVED:

COMMITTEE CHAIR	Michelle B. Goodwin, Ed.D.
COMMITTEE MEMBERS	Sandy C. Bales, Ed.D.
	Amy R. McDaniel, Ph.D.
CHAIR, GRADUATE STUDIES	Scott B. Watson, Ph.D.

Abstract

Marcia Wright Williams. COMPARISON OF FIFTH-GRADE STUDENTS' MATHEMATICS ACHIEVEMENT AS EVIDENCED BY GEORGIA'S CRITERION-REFERENCED COMPETENCY TEST: TRADITIONAL AND DEPARTMENTALIZED SETTINGS. (Under the direction of Dr. Michelle B. Goodwin) School of Education, March 2009. This study examined the effect of traditional (self-contained, one teacher for all academic subjects) and departmentalized (math taught by a different teacher) instruction upon the mathematics CRCT achievement of fifth-grade general education students. A secondary purpose addressed teachers' experiences, perceptions, and opinions concerning the classroom structure at this level. The 2007 and 2008 CRCT math data was used with a total of 9,386 students. The researcher's Data Collection and Opinions (DCO) for Teachers surveyed 180 fifth-grade teachers. A *z* score population proportion and a two-sample *t test* determined significant differences between the two structures. Results of the passing percentages showed a significant difference in favor of the departmentalized setting in 2007. DCO findings found departmentalized options as teachers' preferred choice of structure for fifth-grade students with a continued need to include teachers in decision-making. Additional results with implications for administrators concerning the organizational structure decision for upper elementary levels are provided. Recommendations for further research studies are also included.

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CHAPTER ONE: INTRODUCTION

The elementary classroom structure with relevance to student achievement is just as unresolved today as it was decades ago. Diverse structured arrangements are often debated and discussed. These discussions involve differing opinions from the individual school-level teachers, administrators, and parents to the district-wide and state-level curriculum personnel. Every stakeholder involved in these deliberations has a personal view regarding the best type of organization for instruction in core subject areas at the elementary level (Ackerlund, 1959; Canady & Rettig, 2008; Catledge-Howard, Ward, & Dilworth, 2003; Lamme, 1976; Livingston, 1961; McGrath & Rust, 2002).

With the 2007 reauthorization of the original 2001 *No Child Left Behind Act* (NCLB), a paramount level of instruction is needed to improve the academic achievement of every student. The demands are intensified for math and reading excellence, annual testing, higher expectations with more accountability, and the necessity to have effective teachers in core academic subjects in every classroom (U.S. Department of Education, No Child Left Behind: Building on Results, 2007). These demands align with the United States Department of Education (USED) concerning the need for greater emphasis on the mathematical achievement of students. According to the article, *The Facts About Math Achievement,* "America's schools are not producing the math excellence required for global leadership and homeland security in the 21st century" (2006, ¶1). With the challenge to maintain the NCLB goals and focus on the mathematical concerns, administrators and teachers must address the best teaching structure to produce the greatest level of student achievement.

Historical and recent empirical studies on the best classroom structure to increase students' achievement in core academic content areas, specifically in the areas of reading and math, have conflicting achievement results. Recently released in 2008, *The Final Report of the National Mathematics Advisory Panel* (2008) probed into the value of mathematics specialists at the elementary level. The authors found no difference in the mathematics achievement scores of students in the self-contained, traditional structure when compared to the departmentalized structure. One of the recommendations was indirectly connected to the organizational structure of the elementary schools for math through the use of full-time elementary math teachers which would require a type of departmentalization rather than the traditional (self-contained, one teacher) setting. The recommendation stated:

> The Panel recommends that research be conducted on the use of full-time mathematics teachers in elementary schools. These would be teachers with strong knowledge of mathematics who would teach mathematics full-time to several classrooms of students, rather than teaching many subjects to one class, as is typical in most elementary classrooms. This recommendation for research is based on the Panel's findings about the importance of teachers' mathematical knowledge. The use of teachers who have specialized in elementary mathematics teaching could be a practical alternative to increasing all elementary teachers' content knowledge (a problem of huge scale) by focusing the need for expertise on fewer teachers. (p. 44)

With the recent spotlight being on specialized math teachers providing students with strong mathematical knowledge, it is imperative educators address the

organizational structure options for the elementary school as a possible alternative to increase academic achievement in all areas. The current math report coincides with Bowser's (1984) belief, "National focus on increased educational experience and high academic achievement has put forth an imposing challenge to educators. Elementary educators in particular are charged with developing the educational framework for students" (p. 7).

Throughout research studies, various terms and descriptions are used to define the classroom structures. For the purpose of this research study, the terms *traditional* and *departmentalized* are used with the following definitions:

Traditional—indicates the self-contained general education classroom where students are taught all core, academic subjects of reading/language arts, mathematics, science, and social studies by one teacher for an entire school year.

Departmentalized—specifies the classroom structure where students are taught core, academic subjects by more than one teacher. The number of teachers may vary from two to four. These departmentalized students change classes throughout the day and receive instruction from a teacher who may be considered a specialist in a certain subject area (math) due to an endorsement or specialized training. At other times, teachers are given opportunities to teach the subject of choice.

Purpose of the Study

As in previous studies and due to the abovementioned specific concerns, the primary purpose of this quantitative study is to determine the effect of traditional (self-contained, one teacher for all academic subjects) instruction and departmentalized (math taught by a different teacher) instruction upon the mathematics achievement of fifth-

grade students. A secondary purpose of this study is to address teachers' experiences, perceptions, and opinions concerning the classroom structure at the fifth-grade level. Each purpose is highlighted within chapter one and is further researched, reviewed, studied, and analyzed in the remaining chapters.

Background of the Study

Three specific factors impacted this study: (a) classroom organizational structures; (b) accountability and demands of the curriculum due to state changes; and (c) leadership of teachers to influence the school decisions which will affect the instruction within the classroom setting.

Organizational Structures

In the 1960s, drastic innovations began taking place at the elementary level in response to the 1957 launching of Sputnik. Previous educational reforms were criticized for not sufficiently preparing students in the areas of math and science. A strong emphasis began to be placed on increasing the mathematics and science skills of teachers. As a result, organizational adjustments began to surface. These changes started to influence the decisions made by educators (Bowser, 1984; Wiles & Bondi, 1984).

Similar reforms are taking place today in the 21st century. The *Elementary and Secondary Education Act of 1965* was the impetus for the inception of the present-day *No Child Left Behind Act of 2001* with reauthorization in 2007. Schools are required to meet the demands of the legislation. Two major factors of this legislation involve the need to continue to strive for student achievement excellence and to make teachers accountable in several areas. The United States Department of Education reported that not only do teachers need to be highly qualified in the areas of teaching, but teachers also are to be

accountable for the students' mastery of academic content (U.S. Department of Education, No Child Left Behind: Highly qualified teachers for every child, 2006).

Educational leaders are attempting new reforms to meet the mastery needs of all students and to identify the teachers who are most qualified to lead the instruction of students. However, when disappointing test results are returned in the spring, one of the pressing questions often asked is: What is the most beneficial organizational method at the elementary level to generate higher achievement scores next year on the standardized tests?

Several types of classroom organizational structures are used in schools which influence the instructional delivery of core content. The types that occur most frequently in research are the traditional, one teacher, self-contained classroom and the departmentalized, more than one teacher setting where students change classes. The departmentalized classrooms may also include: semi-departmentalized classes, teams/team teaching, co-teaching, or specific innovative scheduling structures.

Historically, elementary teachers operate in the traditional, compartmentalized or self-contained fashion. One teacher has the responsibility of teaching all core academic subjects to a class of students for an entire school year. These core subjects include: mathematics, language arts (reading, grammar and mechanics, writing process, penmanship), science, and social studies. With the exception of physical education, art, and music, the students are with the same teacher throughout the day. The assumption is made that all traditional, compartmentalized (self-contained) teachers are subject matter generalists, equally strong in all core academic subject areas. However, according to

Chan & Jarman (2004) most teachers are not as interested nor as knowledgeable as needed in every area.

The *National Mathematics Advisory Panel* (2008) reports, "Teachers cannot teach what they do not know" (p. xxi). Because of these knowledge issues, elementary teachers face difficult challenges to meet the needs of every student to master the content of all core subject areas. Conversely, there appears to be a more positive interpersonal relationship between students and teachers in the traditional classroom model (Bezeau, 2007; Garcia, 2007; McPartland, 1987).

In contrast to the traditional organizational structure, the departmentalized structure is most often used in research to describe classrooms in which students experience more than one teacher for core academic subjects. This familiar structure is normally found at the middle and high school levels, but in some incidences, this structure is also found at the elementary level. Teachers usually specialize in one specific core content area and teach that subject to several groups of students who move to various classrooms throughout the day (Chan & Jarman 2004; Garcia, 2007).

A couple of researchers, Garcia (2007) and McPartland (1987), identified semi-departmentalized classroom as an alternative organizational structure. This type of organization is a modified version of departmentalized classes where only two or three teachers share the teaching responsibilities within a given day to two or three groups of students. This arrangement varies among schools but allows teachers the opportunity to teach in their area of personal strength and further provides effective planning time with fewer subject preparations.

An added facet to the opposing traditional structure, according to Erb (1999), is an interdisciplinary team. Interdisciplinary teams share a common planning time for teachers which allows for greater collaboration and support. It offers the opportunity to relate subjects to each other in order to better serve the identical student cohorts.

Other departmentalized structures include team teaching and co-teaching. In some instances this may refer to general and/or special education teachers. McPartland (1987) defines the term, "team teaching—in which two or more teachers provide instruction to a shared large class of students" (pp. 3-4). The co-teaching structure usually refers to a partnership between a general classroom teacher and a special education teacher. The teachers plan, teach, and share the same group of students to support the diverse academic needs of all students within a single physical space (Cook & Friend, 1995).

"No form of organization guarantees success" according to Bowser (1984, p. 6). It is, therefore, necessary to consider another area that impacts student success. An area involving the changes in a state's curriculum requires teachers to become more knowledgeable and competent in content and strategies.

Curriculum Changes

The second factor that influenced this study was the current curriculum changes within the state of Georgia. In January of 2002, an audit revealed the state's Quality Core Curriculum (QCC) was inadequate and needed major revisions because it did not meet the national standards. Teachers did not use the QCC as a guide for instruction. An effective curriculum was needed to provide teachers with a direct avenue for instruction and assessment (Georgia Standards, 2007).

After many months of collaboration with teams of educators from Georgia and other states and nations, along with expert guidance from national organizations such as the National Council of Teachers of Mathematics and American Association for the Advancement of Science, the new Georgia Performance Standards (GPS) were developed. Since the beginning of the 2004-2005 school year, Georgia's teachers have been consistently trained in the new GPS. The training/implementation phase occurred on a two-year cycle. The first year prepared teachers through a series of in-depth trainings for the specific subject and grade-level implementation. During the second year, the implementation phase, teachers were monitored and assisted with the new GPS. Test questions on the Criterion-Referenced Competency Test (CRCT) were rewritten and aligned to reflect the new standards. Information from these assessments is used to diagnose students' individual strengths and areas that need improvement. The 2008 spring administration of the Georgia CRCT was the first time fifth-grade students' mathematics achievement was measured based on standards instruction using the new GPS curriculum. The fifth-grade core academic subjects of reading/ language arts, math, and science GPS testing were fully implemented with the 2008 testing. Social Studies GPS will be tested for the first time in the spring of 2009 (Georgia Standards, 2007).

Georgia's new GPS is curriculum is measured using the Criterion-Referenced Competency Test. This test meets the requirements of the NCLB regulations regarding student assessment. The new standards provide a more rigorous and performance-based curriculum needed to meet the pressing demands of the 21st century. Furthermore, the new standards are requiring teachers to make major adjustments in teaching specific content standards and employ pedagogical skills to engage all learners. The new

adjustments in the state's mathematics curriculum, along with a school's organizational structure leads to another factor which might impact student achievement: teacher leadership. Bahner (1965) wrote about the same leadership concerns when he said, "The people within the organization determine the success of that organization. However, improving the structure enables teachers to do even better jobs than they were doing before" (p. 341). Specifically, each school must consider the most excellent structure for the students at the particular school, not a general choice for an entire school district. While some teachers may not desire to be concerned with school decisions, teachers' organizational structure preference at the individual school level should impact the considered structure decision.

Teacher Leadership

The third factor to influence this study involves the leadership of teachers to be involved in the decisions of the school. Maeroff (1988) wrote:

> Teachers throughout the nation need to be seen in a new way. That change in perception can be the beginning of empowerment. And the empowerment of teachers is essential if the schools are to improve. As long as teachers are not adequately valued by themselves and by others they are not apt to perform with the necessary assurance and authority to do the job as well as they can. . . . More than many other occupations, teaching is practiced in isolation—an isolation that is crushing at times. (pp. 473-74)

Teachers are often overworked and unappreciated by students, parents, and occasionally by colleagues. Shared decision making is a rarity with teachers' opinions and ideas seldom heard by educational decision makers (Maeroff, 1988). Teachers want

to be able to influence the choices and decisions made for the school. Too often, administrators have their own plan and agenda. However, when a principal collaborates and engages teachers in school-based decisions, results will not only empower the teachers, but the teacher will experience support from others and experience better relationships among all stakeholders (Barth, 2006).

With the influence of the previously identified factors of organizational structure, new GPS curriculum changes, and leadership of teachers, school personnel continue to question the best structure for organizing or scheduling students in order to increase student achievement. With the results of this study, the possibility of reorganizing the classroom structure to make instructional changes is perhaps a new avenue to improve student achievement scores to meet the requirements set forth by NCLB. In addition to classroom structure, curricular changes and teacher input have led the researcher to delve into this research study. The likelihood classroom structural change and/or teacher input is a predictor for student achievement should be further analyzed as stated in the following problem statement.

Statement of the Problem

The predominant problem identified in this study is to determine the best organizational structure—traditional or departmentalized—to produce the greatest improvement in fifth-grade students' math achievement scores as measured by the Georgia CRCT. A secondary related issue addresses the role of teachers' experiences, perceptions, and opinions regarding the organizational decision. From these problem areas, the following research questions and null hypotheses were developed.

Research Questions and Hypotheses

Research Question 1: Do general education fifth-grade students have a higher percentage of students passing the minimum state expectations with a performance level of two (2) or three (3) on the 2007 Georgia mathematics CRCT in a traditional (self-contained, one teacher for all academic subjects) classroom or in a departmentalized (math taught by a different teacher) classroom setting?

Null Hypothesis 1-H_{01}: There will be no significant difference in mathematics achievement of traditional, self-contained (one teacher for all academic subjects) fifth-grade general education students as compared to departmentalized (math taught by another teacher) fifth-grade general education students as shown by the percentage passing results of the 2007 Georgia CRCT mathematics scores.

Research Question 2: Do general education fifth-grade students have a higher mean scale score on the 2007 Georgia mathematics CRCT in a traditional classroom than fifth-grade students in a departmentalized classroom setting?

Null Hypothesis 2-H_{02}: There will be no significant difference in the mathematics achievement of traditional (self-contained, one teacher for all academic subjects) fifth-grade general education mathematics students as compared to departmentalized (math taught by different teacher) fifth-grade general education mathematics students as shown by the mean scale score on the 2007 Georgia CRCT mathematics scores.

Research Question 3: Do general education fifth-grade students have a higher percentage of students passing the minimum state expectations with a performance level of two (2) or three (3) on the 2008 Georgia mathematics CRCT in a traditional (self-contained, one teacher for all academic subjects) classroom or in a departmentalized (math taught by a different teacher) classroom setting?

Null Hypothesis 3-H_{03}: There will be no significant difference in mathematics achievement of traditional, self-contained (one teacher for all academic subjects) fifth-grade general education students as compared to departmentalized (math taught by another teacher) fifth-grade general education students as shown by the percentage passing results of the 2008 Georgia CRCT mathematics scores.

Research Question 4: Do general education fifth-grade students have a higher mean scale score on the 2008 Georgia mathematics CRCT in a traditional classroom than fifth-grade students in a departmentalized classroom setting?

Null Hypothesis 4-H_{04}: There will be no significant difference in the mathematics achievement of traditional (self-contained, one teacher for all academic subjects) fifth-grade general education mathematics students as compared to departmentalized (math taught by different teacher) fifth-grade general education mathematics students as shown by the mean scale score on the 2008 Georgia CRCT mathematics scores.

Research Question 5: Which organizational structure do fifth-grade teachers prefer for the instruction of fifth-grade students?

Research Question 6: Do fifth-grade teachers have a voice in the school-based decision of determining the organizational structure for fifth-grade students?

Research Question 7: Do fifth-grade teachers believe their initial college training adequately prepared them to teach all core academic subjects at the fifth-grade level?

Overview of Methodology

Fifth-grade students in Georgia represent the population for the research study. The sample for this study includes over 4,500 students per year in 57 elementary schools residing in a twelve-county area in northeast Georgia. All elementary schools in a

regional educational service agency (RESA) district were requested to participate. One hundred percent of the schools agreed. With assistance from the districts' superintendents, principals, and a fifth-grade contact person, fifth-grade classes were identified as having been organized in the traditional setting or in the departmentalized setting during the 2006-2007 and 2007-2008 school years. The data were divided into two specific levels, students taught math in a traditional, self-contained classroom with one teacher who teaches all core subjects or students taught math in a departmentalized classroom where the students changed classes and were taught by more than one teacher in a given day as displayed in Appendixes G and H. All students identified with special needs were excluded from the study.

The study relied largely upon the 2007 and 2008 spring archived CRCT data. Using the fifth-grade math scores, a *z* score population proportion distribution was used to compare the passing percentages of students with performance levels of two (2) or three (3) in the two structures. Additionally, a two-sample *t test* was used to determine significant differences between the mean scale scores of the traditional classroom of students and the departmentalized students. All statistical analyses were performed using the Statistical Package for the Social Sciences software (SPSS). The study describes the mean and standard deviation using an alpha level of .05 for statistical significance on *t* tests and .005 for *z* scores.

To address teacher perceptions and opinions concerning the organizational structure of the classroom, an anonymous, electronic teacher data collection and opinion instrument (DCO) was administered to all fifth-grade teachers in 57 of the 59 participating schools. Findings from the teachers' results were compiled, summarized,

and presented in Tables 11-14 by reporting the total percentages of item responses. Teacher responses were used to address *Research Questions #5, #6, and #7* and to supplement the CRCT statistical comparisons between the traditional and departmentalized classroom structures.

Definition of Terms

Due to inconsistent terminology in the literature, the following terms have been defined to enhance the reader's understanding of terms used throughout this study:

Co-teaching. A particular classroom setting that involves a general education teacher and a special education teacher. Both teachers share in the responsibility of teaching a classroom of students with diverse academic needs. This type of teaching may also be referred to as an inclusive class when special education students remain in the general education classes and are usually not removed to attend a resource class.

Criterion-Referenced Competency Test (CRCT). The CRCT is the statewide annual assessment used since 2002 by the state of Georgia in grades one through eight. These assessments measure the acquired skills and knowledge of students as described by the state's curriculum. Information from these assessments can be used to diagnose students' individual strengths and areas that need improvement.

Departmentalization. Departmentalization of classes for instruction is the most preferred type of classroom organization for instruction at the middle school and high school levels and is sometimes used at the elementary level. "A team of teachers working as subject-area specialists" (DelViscio & Muffs, 2007, p. 1). Four or more teachers are responsible for delivering the instruction of the core subjects to the entire grade level. In some research findings, the term *departmentalization* means, "Teachers teach in their

area of specialization and students move from one classroom to another for instruction" (Chan & Jarman, 2004, p. 1). The number of departmentalized teachers is determined by a minimum of two teachers.

Georgia Performance Standards (GPS). The GPS serves as a guide for teachers to be knowledgeable about what the students are expected to know, understand, do, and master by the end of the academic school year. These standards are based on best practices that have been successful and effective in other states and nations. (Georgia Standards, 2007)

Innovative Scheduling. A different approach designed to suggest multiple opportunities to assist elementary administrators in maximizing strengths of the individual teacher and at the same time minimizing the weaknesses that might interfere with students' learning. Schedules are aligned to the teaming/departmentalization structures ranging from two-teacher partner teams to a larger team as well (Canady & Rettig, 2008).

Interdisciplinary. The term used for an organizational structure or curriculum modification. For the organizational feature, two or more teachers share the same students and a common planning time which might be considered one of the departmentalized options. On the other hand, this term might also be used in the development of lessons that integrate several concepts and/or subjects (Erb, 1999).

Non-traditional. Non-traditional refers to any and all organizational structures with more than one teacher responsible for a group of students. Specific structures include: departmentalized, semi-departmentalized or interdisciplinary teams, teaming/ team teaching, co-teaching, and scheduling.

Quality Core Curriculum (QCC). The QCC for Georgia was mandated as a part of the Quality Basic Education Act (QBE) in 1985. It is the former curriculum for the state of Georgia being replaced by the standards-based curriculum, known as GPS.

Performance levels. The three levels used to measure a student's performance on the Georgia CRCT. They are defined as: One (1)—Does Not Meet Expectations; Two (2)—Meets Expectations; and Three (3)—Exceeds Expectations.

Semi-departmentalized. This organizational structure consists of two or three teachers sharing the responsibility of teaching the four core academic subjects for a particular grade level. It is one of the alternative options for the *departmentalized* structure (Garcia, 2007).

Scale score. A numerical score that coincides with the performance levels of CRCT results. Scores at or above 850 indicate a level of exceeding the expectation; scores of 800-849 means a student meets the expectation; and, below 800 denotes a student who has not met the expectation or minimum level of proficiency required for the test.

Teaming/Team teaching. In some instances, these terms are used synonymously with co-teaching. However, the term most often refers to two or more teachers working together and sharing the responsibilities of a larger class of students at the time. Other terms suggest team teaching as partner, collaborative, and cooperative teams. They are in the classroom with different responsibilities.

Traditional. The classroom structure with one teacher teaching the required four core academic subjects to one group of students for the complete academic year. The only time the students are away from the teacher would be for lunch and special

activities, such as art, music, and physical education. Compartmentalized and self-contained terms are synonymous with traditional (Garcia, 2007).

Professional Significance of the Study

School district personnel, local school administrators, and teachers are concerned with the many facets of NCLB. Since the emphasis on mathematics achievement is a priority in the nation today, the question is asked once again, which fifth-grade organizational structure is best to achieve the greatest student achievement in mathematics on the Georgia CRCT. Therefore, the implications of the study are three-fold:

1. This study may support system-level personnel and elementary school administrators as they struggle to make effective decisions regarding the improvement of student achievement in mathematics at the fifth grade level.
2. Findings from this study may assist the school system in making decisions regarding appropriate professional learning opportunities.
3. All school personnel will benefit from the DCO results providing insight into teachers' experiences, opinions, and perceptions of the traditional and departmentalized classroom settings which may impact student achievement.

Since the research differs between classroom organizational instruction in various content areas, school personnel often have mixed opinions. The mathematics achievement results from this study will possibly give educators another opportunity to examine whether one particular organizational instructional method is more successful than another for fifth-grade students. The findings of this study will also provide

administrators with valuable information concerning teachers' perceptions and opinions regarding the classroom organizational structure.

Organization of the Study

Following this introductory chapter is a review of related literature and research. The literature review of Chapter Two focuses on descriptive theoretical and conceptual frameworks of organizational structures in elementary schools along with a summary of student achievement results. Also included is the importance of teacher participation in decisions regarding curriculum implementation. Chapter Three describes the methods and procedures utilized in the research study. The analyses of the CRCT data and DCO results are reported in Chapter Four. Finally, Chapter Five summarizes the conclusions from the research results and suggests recommendations for future studies.

CHAPTER TWO: REVIEW OF THE LITERATURE

A review of the related literature for this study was conducted to ascertain the research studies and information available concerning the elementary school organizational structure and the possible impact on student achievement. With limited and inconsistent information, the search further led the researcher to explore other influential areas with possible impacts on the instructional arrangement and academic achievement of upper elementary students. These areas included not only the traditional and departmentalized organizational structures, but teachers' leadership roles with valued input into the educational decisions at the school level.

The review of literature is organized into four areas. The first area explores the theoretical/conceptual framework of the organizational structures of the elementary classroom. The traditional, self-contained, compartmentalized classroom along with the multifaceted options of departmentalized instructional configurations. The departmentalized options of departmentalized, semi-departmentalized, teaming, team teaching, co-teaching settings, and scheduling are examined. The second area, student achievement findings in different types of organizational structures are highlighted in a chronological manner. The third area delves into teacher leadership which encompasses the important concepts of teacher empowerment for shared decision making in the educational environment. Finally, the fourth area summarizes the review of literature findings.

Theoretical/Conceptual Framework

Traditional Classroom Structure

In the early 1920s and 1930s, several educational reforms were taking place in the United States, particularly in the elementary school. These areas included an increase in elementary enrollment, new subjects being added to the curriculum, and extending the school day. John Dewey and other educational authorities observed "schools as agencies of society designed to improve our democratic way of life" (Wiles & Bondi, 1984, p. 268). Dewey further insisted that the elementary school should "build on the interest of the students and should represent real life by taking up and continuing the activities with which the child is already familiar with at home" (Wiles & Bondi, 1984, pp. 267-268). However, when Sputnik was launched in 1957, the math and science curriculum was adapted to meet the pressing needs. The organizational structures in the elementary schools began to make adjustments to coincide with the new curriculum (Wiles & Bondi, 1984).

In the past, the traditional, self-contained classroom structure has been considered the basic norm arrangement for many school systems. Each elementary teacher taught everything to the same group of students for an entire academic year. One of the earliest plans to strengthen the traditional classroom was to provide specialist teachers to teach the physical education, art, and music classes (Heathers, 1960). The only absence of the core teacher might have been for the specialty classes, lunch, recess, or particular classes for remediation and enrichment. The traditional, self-contained classrooms were organized in this manner due to the idea of educating all aspects of the young child, often referenced as the 'whole child' (Ackerlund, 1959; Anderson, 1962; Bahner, 1965; Bezeau, 2007; Bowser, 1984; Canady & Rettig, 2008; Garcia, 2007; Heathers, 1960;

Legters, McDill & McPartland, 1993; Lobdell & van Ness, 1963; Naumann, 1977; Patton, 2003; Walters, 1970).

Several years ago, Walters (1970) strongly disagreed with the trend to modify the traditional, self-contained classroom. He expressed his opposing views to the alternative departmentalized setting by basing his opinion on four educational concepts which strengthens the traditional classroom. The concepts included reinforcement of learning, individualization of instruction, development of self-direction, and psychological needs of the child.

Elementary classroom organizational studies were minimal for several years after the 1970s. With the limited modern knowledge relative to which organizational structures were being used across the nation Rogers and Palardy (1987) conducted a survey of 125 elementary school principals in the southeastern section of the United States. The information gathered identified the organizational structure and grouping strategies used from kindergarten through sixth grade. Findings indicated, ". . . the majority of classrooms was self-contained with the percentage of such classes dropping at each successive level" (p. 113). Another finding indicated the smaller schools had a higher percentage of classes using the traditional model over the non-traditional, departmentalized classroom model.

An accepted advantage of the traditional, one teacher, and self-contained classroom revolved around its flexibility in the daily schedule. The teacher had time to extend a specific subject area if necessary. The particular setting further permitted the use of important daily instructional time in class. The departmentalized classroom setting also revealed another issue—wasted time due to students gathering belongings to transition to

another class for instruction by another teacher (Elkind, 1988, Culyer, 19884). In addition, the traditional classroom structure further afforded teachers the necessary occasions to adjust to the various modes/learning styles, present within a classroom of students (Squires, Huitt, & Segars, 1983).

One very popular opinion of the traditional classroom setting is the ability of the teacher to be the specialist in all core academic subject areas. This teacher has the responsibility for teaching the subjects of reading/language arts, mathematics, science, and social studies to the same group of students for a full academic year. It is assumed an elementary traditional, self-contained teacher is equally strong in all these academic areas, an expert, or, a generalist (Ackerlund, 1959; Anderson, 1962; Bezeau, 2007; Chan & Jarman, 2004; Culyer, 1984; Patton, 2003).

In 1989 a group of parents became concerned about the consequences of moving away from the elementary traditional classroom setting to the departmentalized setting. The Board of Directors of the Des Moines Iowa Public Schools requested the Department of Elementary Education to investigate the issue. In the report *Elementary School Organization: Self-Contained and Departmentalized Instruction* (1989), the traditional teacher was viewed as a generalist, rather than a specialist in the departmentalized classroom. The report findings further advocated for the self-contained classroom by indicating the elementary level should be “child-centered rather than subject-centered” (p. 11). It was additionally reported the students within the traditional, self-contained classroom had “the security of working with one teacher all day” (p. 11).

Other researchers agreed with the Iowa report. In order to meet the needs of the whole child in one classroom setting, students required a special connection with an

individual teacher. For example, Bahner (1965) expressed, “The self-contained teacher presumably has a greater chance to establish an intimate rapport with the pupils—a rapport which positively influences the learning situation” (p.337). Ediger (1994) recognized a teacher in a self-contained classroom had ample opportunities to be knowledgeable of the whole child, from the academic concerns to the emotional stability of familiarity. Walters (1970) concurred, “Almost all modern theories of education accept the concept that passiveness toward learning experiences is often an outcome when basic psychological needs are not satisfied’ (p. 85). Walters further expressed the lack of a healthy emotional climate in the home for many students and believed that the school must attempt to meet those needs in a traditional, one teacher environment rather than many teachers and classrooms in a departmentalized setting. “The child belongs to no one particular teacher. It is no wonder that children in the departmental program frequently begin to feel that their needs have ceased to be important to teachers. Such an atmosphere can lead to very frustrated behavior” (p. 95).

An article from the Learning Points Associates of the North Central Regional Education Laboratory by Letgers, McDill, & McPartland (1993) agreed with the above findings by stating the teachers in the earlier grades “are likely to adopt a ‘student-orientation’ in which they take a broad view of the education of the ‘whole child’ and assume a personal responsibility for the success of each individual in their class” (¶ 2). This correlation is further highlighted in a book by Bezeau (2007). It was revealed the personal relationship between teacher and students in the self-contained, traditional class is a major strength over students and teachers who are in other types of classroom settings.

In the elementary school the one teacher, traditional classroom is the characteristic setting. Fifth grade is typically the last grade level where students experience the traditional classroom before they advance to the middle grades and a non-traditional classroom. McPartland (1987) conducted a study in the middle grades. The study of balancing high quality subject-matter and teacher-student relations indicated the traditional, self-contained subject instruction is of great benefit to the relationships between the students and the teachers which is not found in the departmentalized setting.

Canady & Rettig (2008) reveal that the traditional classroom would be favored, "given ideal circumstances, that is, teachers who have a strong content knowledge and pedagogical skills in all subject areas, deep understanding of child development, a caring soul, and an abiding belief that all children can learn" (p. 127). They continue by indicating "all the typical arguments for maintaining it, such as the need for young children to have the security and support of one competent, caring adult" (p. 127). However, they "also must admit that not all self-contained classrooms operated according to the textbook ideal" (p. 127).

Along with the theoretical/conceptual framework for the traditional classroom, the alternative classroom structure is reviewed. The following sub section addresses the theoretical/conceptual framework for the departmentalized classroom structures.

Departmentalized Classroom Structures

In contrast to the one teacher, traditional organizational structure several non-traditional departmentalized classroom settings have been used for decades and different models are still in use in elementary schools today. Even though McPartland's (1987) study concluded that the departmentalized setting weakens the student to teacher

relationships, “the quality of instruction in specialized subject matter” improves in a departmentalized setting (p. 1). Additionally, the belief that the shortcoming of high-quality subject matter weakens the traditional classroom, it is necessary to investigate the contrasting departmentalized settings for improving the quality of instruction which may impact student achievement at the elementary level.

Educational authorities considered the demanding restraints on the traditional elementary teacher and what should be done to alleviate the stressors. With the educational changes and reforms to address the accountability pressures, massive changes in the curriculum have taken place in recent years. No consideration was ever given to teacher strengths or weaknesses and it is “unreasonable to expect all teachers to be experts in all subject areas in the upper elementary grades” (Canady & Rettig, 2008, p. 127).

Research studies and reviews addressed departmentalized classroom settings with assorted descriptions. These settings range from: (a) departmentalized; (b) semi-departmentalized; (c) teaming/team teaching; (d) co-teaching; to the newer concept of (e) innovative scheduling. Each alternative setting for the departmentalized structure is further discussed in this portion of Chapter Two.

Departmentalization

DelViscio & Muffs (2007) recently reported departmentalization of classes for instruction as being the most preferred type of classroom organization for instruction, especially at the middle school and high school levels. This structure consists of a group of teachers teaching a specific subject area in which they are considered the specialist. A

term with many facets, *departmentalized*, has been the center of controversy for over 80 years.

In *The Elementary School Journal*, Becker & Gleason (1927) discussed the results of an educators' survey which measured the views on departmentalization and whether or not this organizational type would be valuable in the teaching arena. With only 27 replies, several qualities of importance were noted which are in agreement with modern-day findings. Some oppose this type of organization due to the segregation of subjects; teaching subjects as a priority over the students; and, lack of the 'hominess for the child.' On the other hand, positive qualities include teachers being experts and specialists in subjects rather than the generalists found in the traditional setting; eagerness to teach the specialized subject; and, "professional preparation is intensified" (p. 62).

Several years later, Ackerlund (1959) completed a survey of elementary teachers with differing opinions about the type of classroom organization preferred at the elementary level. In grades three through six, the majority of teachers favored the departmentalized classroom yet indicated unpreparedness in the teaching of all required subject areas being taught. It was further recognized, "There is no evidence that adjustment to several different teaching personalities simultaneously is harmful to children; it could even be valuable" (p. 285).

Anderson (1962) focused attention on the need for specialized teachers at the elementary level. He discussed a program of two teachers sharing two groups of students during the day, which was a type of departmentalized structure. However, before subject assignments were made, the consideration of the teacher's academic background and competence was regarded. Anderson further stated, "Some teachers who have mastered

an area of knowledge may be able to lead their pupils to a comprehension of the basic ideas of the discipline" (p. 254). As in other professions, teachers may be proficient in some areas and less skilled in additional areas. Gough (1982) highlighted the point for specialization, "Whether these weaknesses stem from the shotgun approach to preservice preparation or from teachers' individual differences in preference and ability, the fact remains that teachers cannot teach effectively and enthusiastically what they have not mastered themselves" (p. 41). Elkind (1988) also favors the teacher specialists which allows the teacher the opportunity to emphasize the subject preference based on experience and training.

One must be cautious in using the term, *departmentalized*. It has different meanings for different groups of people. Lobdell and van Ness (1963) reported an assortment of degrees of the departmentalized classroom ranging from one to many subjects being taught by specialists. They further contend that the traditional, self-contained and departmentalized structures are ". . . at the opposite ends of a continuum; any deviation from the pure self-contained represents a point on the continuum in the direction of departmentalization" (p. 212).

Whenever an elementary teacher graduates from college, there is usually a desired grade preference. Within individual schools the needs and structures are different. Teachers may not be able to teach in the preferred field. However, it is often recognized "that most classroom teachers are not multi-talented, and they have no choice but to teach in some areas where they have no fundamental interest" (Chan & Jarman, 2004, p. 70).

Chan and Jarman (2004) addressed the negative charges that the issues of collaboration and student emotional needs are not met outside the traditional structure. A

list of advantages for moving away from the traditional to a departmentalized setting for instruction has been delineated:

> *Specialization*. Students receive basic education from teachers specialized in particular disciplines. From the teachers' perspective, instructional time is better utilized by concentrating on fewer disciplines.
>
> *Instructional teams*. Grade-level instructional teams can be formed to coordinate teaching efforts across each discipline. Students benefit because they are exposed to the instructional wisdom of more than one teacher.
>
> *Teacher retention*. With a more focused workload, teachers are able to complete their teaching assignments with greater satisfaction. The result is greater stability and retention of highly qualified teachers.
>
> *Transition.* Departmentalization in elementary schools aligns with middle schools organization, better preparing students for transition.
>
> *Flexibility.* Departmentalization allows students to move between grade levels according to ability, and from ability group to ability group within grade levels. (p. 70)

In an article waiting to be printed, Chan, Terry, and Bessette (in press) expound upon additional reasons for fourth and fifth-grade students to move to a departmentalized setting. The transition into middle school often causes concerns for students and parents.

> Departmentalization has the potential to provide fourth and fifth graders with the tools needed to successfully begin transitioning to a middle school setting. Educators need to seriously challenge the traditional structure of elementary schools and explore the possibility of departmentalization in their own

> neighborhood schools. . . . Educators need to understand that a successful transition into middle school begins in the elementary grades. With this understanding, elementary and middle grade educators can collaborate to structure departmentalization programs so that young adolescents get the best start possible in their middle school and beyond (in press).

In addition to the departmentalized concept, a modified version of departmentalized is characterized by some researchers in the following descriptions of semi-departmentalized, team teaching/teaming, and innovative scheduling.

Semi-departmentalized setting

McPartland (1987) describes alternative approaches to the traditional, classroom and the completely departmentalized classroom. Whereas the completely departmentalized structure has one teacher teaching many classes of one subject, a teacher in a semi-departmentalized setting will instruct "more than one class in more than one related subject (such as math and science) but not in all major subjects" (p. 3). Bezeau (2007) suggests this type of organization is a substitute to the self-contained classroom at the elementary level. The students have a homeroom teacher who may be a subject specialist even though the students will go to another teacher for other subjects. This idea coincides with the specialist suggestion from Becker & Gleason (1927) mentioned in the departmentalization portion of this chapter. Furthermore, the specialist idea supports the strong urgency for experienced, knowledgeable math teachers to "fill the nation's classrooms" (U.S. Department of Education – The facts about math achievement, 2006, ¶ 6).

Bezeau (2007) suggests a setting of semi-departmentalized as an option to offset the negative effects by promoting a positive teacher-student climate. This modern suggestion supports Broadhead's (1960) findings in the study of fifth-grade students in Tulsa, Oklahoma. Using the SRA Junior Inventory, the social adjustment of the semi-departmentalized students compared to the self-contained norm group "showed higher levels of adjustment as measured by the inventory" (p. 389). A year later, Livingston (1961) broadened the Tulsa study by surveying the fifth-grade students who had been self-contained in grades one and two, but semi-departmentalized in grades three through five. Livingston agreed with Broadhead's findings of a student's personal and social development not being hindered by the semi-departmentalized organization.

Garcia (2007) suggests specific scenarios for a semi-departmentalized structure. One scenario is that one classroom teacher teaches two subjects to a group of students while the counterpart teacher is teaching the other two subjects to another group in a different classroom. After a designated span of time, the groups of students change classrooms. An additional scenario might be one teacher teaching all the language arts to two groups, plus science or social studies to a homeroom group. The other teacher would be responsible for the math and science or social studies for both groups, plus the other area of science or social studies to the other homeroom group.

Teaming/Team teaching

As another type of departmentalized classroom, teaming/team teaching will encompass a variety of arrangements. Prior to team teaching, Bahner (1965) reported all elementary classrooms were either self-contained or departmentalized organizations. The opinion of teaming involved a "self-contained team with specialization" (p. 337).

Furthermore, the recognition for the team to cooperate and plan together was a necessity. This thought aligns with other researchers who recommend collaboration, planning, and evaluation among two or more teachers. With more than one educator involved in the process of teaching a group of students, higher quality experiences will be provided to address the needs of the individual students. It further provides possible solutions to address specific subjects that might cause difficulty for some elementary teachers (Anderson, 1962; Shaplin, 1965; York, 1969).

As in the other departmentalized settings, the concern for the welfare of the students is of great interest. With the student spending approximately half of their waking hours at school, the teacher has a strong influence on the child. In a study to address the differences between the personality development of students in a team teaching classroom and a self-contained classroom, George and Cruse (1973) administered the *Children's Personality Questionnaire* to 113 students. Results indicated students taught through the team teaching approach, appeared more "self-assured and controlled, with a lesser need for attention and success, while developing less warmth, assertiveness and intellectual independence" (p. 50).

A study by Shaw, Stratil, and Reynolds (1973) made a connection between team teaching and teacher attitudes of 141 teachers. Team teachers were compared with traditional teachers. Team members worked together and collaborated with other teachers throughout the day while the self-contained teachers were mostly isolated from the other teachers in the school. Using a Likert scale as the measurement instrument, attitudinal surveys were given in September and May. Scores did not differ in September, but in

May the results differed and conclusions were drawn suggesting a higher positive attitude was maintained when supported by others.

In an article, “Teaming with Success,” Rottier (1996) presented some helpful advice for successful teams in the middle school. Teaming works to benefit teaching and learning but it must begin with the principals. Principals “must sincerely believe teaming positively affects learning, and this belief must be supported by a genuine understanding of the nature of teaming. Unless principals understand their relationship to teaming, teams will not provide all benefits possible” (p. 19).

Several positive aspects with reference to team teaching were concluded in a study of collaboration by Zadra (1998). The qualitative results offer guidance to teachers, administrators, and educational leaders considering teaming as a departmentalized organization. Conclusions drawn included: teacher empowerment, inclusion, improved teaching, improved learning, cooperative learning link, and culture of learning.

Schamber (1999) implied that team teaching teams often have conflicting preferences concerning the students and other issues. He reported, “Team teaching puts teachers together in a professional relationship unlike any other in education. Effective teaming takes time and effort to develop; good teams require deliberate effort” (p. 18). Schamber recognized that good intentions are sometimes casualties among all team members. In order to survive the good intentions, Schamber highlighted everyday events that could damage a team’s effectiveness and cautioned teams. The events to avoid included supporting fellow team members in a negative situation, visiting with individual team members rather than the entire team about team concerns, staying uninvolved in a team argument, soliciting professional opinions for team concerns, implementing a new

idea with plans to inform the team at a later date, and "Speaking *for* the team without speaking *to* the team" (p. 21). Another event that could possibly cause an ineffective team is meeting with a parent on behalf of an absent team member. The team should schedule parent meetings at a time when all team members can attend. Sharing future instructional plans with students without the support of other team members and seeking team support for individual decisions are two other areas that often cause conflicts. Finally, Shamber recognized the most important practice of team teaching is to provide assistance to a team member in classroom distress involving the academic and behavioral needs of the students.

Another teaming term sometimes associated with a departmentalized structure is the *interdisciplinary* teams. These teams are mostly recognized as the developmental type of structure at the middle school level. Williams (1999) describes this teaming situation as a yearly group of two to six teachers delivering instruction to a group of students. He further advocated the smaller two-teacher team as the best choice of organization.

Bishop and Stevenson (2000) reported on the success of using a two or three-person partner team with the most vital aspect being the "relationship between teachers. Adult relationships carry over to students, reflecting values of good humor and respect for learning, work, and each other" (p. 15). Additionally, two core beliefs prevail: (a) the welfare of students is first, then, the teachers' concerns and, (b) complete support and commitment to the education of the students.

A unique form of teaming was piloted with a group of fourth-grade students. It involved combining looping, the European practice of a teacher advancing to the next grade with the same students, and departmentalization. In a small school in New York, a

group of three teachers became individual subject specialists and shared students from grades three through five. A variety of benefits were provided: continuity in instruction with an increase in instructional time; a close working relationship among the three teachers; an improved understanding of cross-grade curriculum; an extended amount of time to work with the same students; increased enthusiasm of teachers teaching the subject area of their choice; and exposing students to a variety of teaching styles that will decrease the anxiety levels of advancing into the middle school (DelViscio & Muffs, 2007).

Co-teaching Setting

Cook and Friend (1995) define co-teaching as "two or more professionals delivering substantive instruction to a diverse, or blended, group of students in a single physical space" (p. 2). This type of classroom setting was first recognized as a strategy for the secondary schools in the 1960s and open-concept schools in the 1970s. Recently, the idea resurfaced "as part of the middle school movement and other school reform efforts" (p. 1). Cook and Friend further explained the combination of teachers. "General educators who specialize in understanding, structuring, and pacing curriculum for groups of students are paired with special educators who specialize in identifying unique learning needs of individual students and enhancing curriculum and instruction to match these needs" (p. 2).

According to Cook (2004), "The *No Child Left Behind Act* and the reauthorization of federal special education legislation have brought increased pressure for educators" (p. 2). This legislation projects the students with learning disabilities and needs should achieve the same success as general education students. Villa, Thousand, & Nevin (2004)

concur that co-teaching “is a creative way to connect with and support others to help all children learn” (p.3).

Through observations of many teachers in co-teaching classroom, Vaughn, Schumm, and Arguelles (1997) identified several models for co-teaching roles involving a general education and a special education teacher. As two teachers reflect upon the individual roles within the classroom, both agree that their co-teaching has had great benefits for the students. “They are convinced that the benefits are not just for students with special needs but for all students” (p. 4).

Innovative Scheduling

An often disregarded option in the elementary school involves the use of specific innovative scheduling for departmentalized classrooms within a school. According to Canady & Rettig (2008), the use of master schedules adjusts for fragmented programs and teacher frustrations that have often been overlooked and unused at the elementary level. With the continued focus on state requirements, mandates of the *No Child Left Behind* legislation, and with the varying strengths of teachers, “it makes a great deal of sense to have that teacher instruct more than one homeroom group” (Canady & Rettig, 2008, pp. 127-128). According to Canady (1988), researchers have suggested ways innovative scheduling can benefit students from time on task to helping the lower achieving students receive more teacher-directed instruction. A few years later, Canady and Rettig (1995) shared three possible issues that can be eliminated by using successful schedules. These include: 1) providing quality time; 2) creating a school climate; and, 3) providing varying learning times.

Most recently, *Elementary School Scheduling* by Canady and Rettig (2008) was published as a valuable tool to provide specific guidelines for multiple types of scheduling which have not typically been found at the elementary level. This different approach to scheduling suggests multiple opportunities to assist elementary administrators in maximizing strengths of the individual teacher and minimizing the weaknesses that might interfere with students' learning. The innovative schedules are aligned to the teaming/departmentalization structures ranging from two-teacher partner teams to a larger team as well.

Reviewing the traditional classroom structure and the multi-faceted departmentalized options, the theoretical/conceptual framework of traditional and departmentalized classrooms has established a basis for this study. The following section discusses the student achievement findings from a variety of research studies. The assorted findings support not only the traditional, one teacher classroom, but the departmentalized (more than one teacher) types of classroom structures as well.

Student Achievement Findings

The student achievement results connected to organizational studies have varied throughout the literature review. For example, McPartland's (1987) study of two organizational structures addressed a balance between high-quality subject matter instruction with positive teacher-student relations. The findings revealed benefits and detriments for each structure. "The study finds self-contained classroom instruction benefits student-teacher relations at a cost to high quality subject-matter instruction, while departmentalization improves the quality of instruction in specialized subject matter at a cost to student-teacher relations" (p. 6). To address the discrepancies and

issues discussed in the literature review, the following student achievement findings features the correlation between the traditional and departmentalized classroom structures with student achievement scores at the elementary and middle school levels in several content areas.

Prior to the rigor of the present-day GPS in mathematics, arithmetic achievement in Georgia involved students discovering, seeing relationships, and making generalizations from data. The specific guidelines for concepts and skills at each grade level were found in the Georgia Mathematics Curriculum Guide. Over 1,000 students in self-contained and departmentalized sixth and seventh grades in Atlanta, Georgia were divided into four groups—two experimental and two controls—with findings tabulated for periods of one and two years. Students were additionally matched according to specific demographics and academic traits. The students' results were measured by the Metropolitan Achievement Tests. Findings indicated the computation and arithmetic reasoning portions of the tests were consistently better for the control, traditional, self-contained group, but not significantly different (Morrison, 1968). The results were consistent with the findings of Harris (1990) years later. Harris evaluated the elementary organizational structures of 854 fifth and sixth-grade student achievement scores in three elementary schools. When the relationships between the traditional, one teacher, self-contained classroom of 491 students were compared to a departmentalized setting with different teachers, of 363 students, there were no significant differences in students' scales scores in mathematics and language arts.

A random sampling of fourth and fifth-grade students in traditional classrooms and departmentalized classrooms were assessed by the Iowa Tests of Basic Skills (ITBS)

in the areas of science and social studies. Over 600 students' ITBS scores were analyzed using a one-way multivariate analysis in science and social studies. Social studies and science results revealed higher mean scores of both grades in the traditional classrooms. When both subject measures were considered collectively, the results differed between the grade levels. The fourth-grade classes (self-contained and departmentalized) differed only in social studies with the traditional class being significantly higher. At the fifth-grade level there were no significant differences in either subject (Bowser, 1984).

Garrigan (1992) noted research findings of departmentalized and traditional classroom settings in a span of almost seventy years from 1923-1988. Within this time frame, 14 studies prevailed in favor of self-contained while only eight studies favored departmentalized. The research also indicated 17 findings with no significant differences noted between the two classroom structures. Garrigan's study used the Missouri Mastery and Achievement Test (MMAT) subtest scores in reading, mathematics, science, and social studies. A random group of sixth-grade students from six school districts revealed the following three findings:

1) Students attending self-contained programs performed significantly higher on the MMAT than students attending departmentalized programs;
2) School organization had no significant effect on MMAT scores regarding gender differences; and
3) According to MMAT scores, school organizational structure had no significant effect on the scores based on the economic levels of these students (Garrigan, 1992, pp. 1-2).

Another study of 60 random sixth-grade students in the Chicago Public Schools explored organizational structures. The standardized reading achievement scores measured using the ITBS were significantly higher in the traditional, self-contained classrooms than in the departmentalized setting (Harris, 1996). No results were measured for the mathematics achievement of students.

Alspaugh and Harting (1995) noted an academic decline in student achievement during the transition year when students were converting from a self-contained classroom to a different type of organization. As with Garrigan's 1992 study, the dependent variable was the MMAT in over 500 school districts with students from kindergarten through the eighth grade being the independent variables. The findings further indicated the decline only happened during the initial transitional year from a traditional classroom to a departmentalized classroom. After the first year, achievement levels appeared to recover.

When comparing student achievement scores between a two-teacher team and a four-teacher team at the middle school Williams (1999) rejected the null hypothesis that no significant difference existed between the two groups. Results indicated the 1996 Iowa Tests of Basic Skills composite mean score from the two-teacher team was 54.52 while the students assigned to the four-teacher team had a 44.77 mean score. Because a difference was found between the socio-economic levels of the two groups, a multivariate analysis of variance test determined significance. Using the *alpha* level of .05, the data was significantly different: $F(1, 4.34) = .039$. The same was true for the 1997 ITBS composite scores, but with a different analysis due to the lack of any differences in the socio-economic status, gender, or race. The two-teacher team students' mean score

equaled 63.51 and the four-teacher students' mean score was 53.07. Using an independent *t test* with the alpha level of .05, the significance was evident: $t(149) = .01$. Other null hypotheses were retained showing no significant differences in the teams concerning grade point average, student attendance, and student satisfaction.

More recently in the state of Tennessee, McGrath and Rust's (2002) study examined the link between the organizational structures and student achievement scores of fifth and sixth-grade students. A sample of 88 students in the self-contained setting was compared with 109 students receiving instruction in a departmentalized setting. Previous findings of the transition time being longer for the departmentalized classes over the more efficient self-contained classes were confirmed. The findings did not reveal any significant difference in actual instruction time between the departmentalized and self-contained settings. For the core subjects of reading, mathematics and social studies, there were no academic differences evident on the Tennessee Comprehensive Assessment Program (TCAP). Conversely, the traditional students' language and science total scale scores were higher than their counterpart departmentalized students' scores in the subject areas of language and science.

In contrast to McGrath and Rust (2002), Moore (2008) studied fourth and fifth-grade student achievement scores on the TCAP and teachers' perspectives from six school systems in Tennessee. The statistical analyses compared the traditional, self-contained classroom with the departmentalized organizational structures to determine if one structure was more effective than the other. While no differences were noted at either grade level in language arts, science, or social studies TCAP achievement scores, fifth-grade students had statistically significant differences in

math favoring the departmentalized structure. Another component of Moore's study addressed teachers' perceptions "of learning practices and organizational structures needed to improve student achievement in upper elementary grades in public schools" (p. 2). No differences were noted among teachers who favored one structure over another. The most preferred classroom structure of teachers (56% for fourth-grade teachers; 72% for fifth-grade teachers) was the departmentalized over the traditional, self-contained setting.

Littlejohn (2002) compared fifth-grade students' achievement scores in mathematics and language arts in a traditional, self-contained classroom with students in a first year team-taught classroom. Using ten different null hypotheses related to the various core academic subject areas and the subgroups of gender, race, and socioeconomic status, nine of the null hypotheses were rejected due to the significant difference results. The self-contained, traditional students scored significantly higher than the team-taught students in math.

In another modern study certain factors were again measured to determine if mathematics achievement was influenced by the organizational structures. Patton (2003) considered the specific effects of ethnicity, gender, and socio-economic status, while comparing the differences between the organizational structures on mathematics achievement of 21,454 fifth-grade students. Findings indicated the students' achievement in the departmentalized settings were slightly higher than the traditional, self-contained group which was in conflict with Littlejohn's (2002) findings. Due to the minimal effect size, Patton (2003) recommended caution when making educational decisions regarding organizational structures. However, in Garcia's (2007) study which included interviews

with principals, the indication of a semi-departmentalized setting was successful if teachers selected this “method of instruction” (p. 48).

Student achievement research findings have been inconsistent with results favoring both the traditional and departmentalized classroom organizations. However, studies by Garcia (2007) and Moore (2005) have referred not only to the specific students’ academic achievement findings but to the input of teachers in making the school-level organizational decision. The necessity of teachers’ opinions being considered is discussed in the next section.

Teacher Leadership

The third area of this literature review delves into the importance of teachers’ involvement in making decisions at the school level. Barth (2001) stresses the necessity of principals to encourage and enlist teachers to become leaders. Not only will the teachers lessen the principal’s load, but the school, the students, and the teachers will benefit. “That pattern of behavior can embed teacher leadership in the school’s culture, cast a wet blanket on it—or have no influence at all” (p. 449). Bruni (1991) suggested an urgent need for elementary math leaders. “We need to nurture the development of a leadership group of elementary school teachers with a special interest in mathematics” (p. 7). This section encompasses the meaning of teacher empowerment, teacher morale and relationships, and shared decision-making into the educational decisions within the school.

Empowerment

Explanations and definitions concerning empowerment vary among educators. Prawat (1991) recognizes the need for a better understanding of empowerment "to facilitate improvements in the lives of teachers and the students they serve" (p. 757). Zembylas & Papanastasiou (2005) explain, "Empowerment is defined and measured in terms of teachers' power to participate in decision-making about teaching and learning conditions" (p. 433). Maeroff (1988) identifies the need for principals to empower teachers in order to build support especially between the administrator and teachers. "Teachers throughout the nation need to be seen in a new way. That change in perception can be the beginning of empowerment. And the empowerment of teachers is essential if the schools are to improve" (p. 473).

Maeroff (1988) identified teacher access to decision-making as one of the three areas in which teachers need to be boosted. The other two areas involved teacher status and knowledge. Teachers are often overworked and unappreciated by students, parents, and at times colleagues. Shared decision making is a rarity with teachers' opinions and ideas seldom heard by educational decision-makers (Maeroff). "As long as teachers are not adequately valued by themselves and by others they are not apt to perform with the necessary assurance and authority to do the job as well as they can. . . . More than many other occupations, teaching is practiced in isolation--an isolation that is crushing at times" (pp. 473-74). When a principal collaborates and engages teachers in school-based decisions, results will not only empower the teachers, but the teacher will experience support from others and better relationships among all stakeholders (Barth, 2006).

Several researchers have discussed the importance of teachers even when planning the restructuring of schools. Barth (1991) encourages teachers and principals to

become involved in the process of change as a collective unit. “Leave your mark on your school – and have some fun – while the window of opportunity is admitting fresh breezes. For soon it will close” (p. 128).

Scheidler (1994) recalls the school reforms of the 1960s and 1970s and wonders if the modern world’s educational reforms will “create and sustain a fundamental change” (p. 45). With the majority of previous reforms returning to earlier ways of working, Scheidler recognizes the value of teacher input as she wrote:

> While new programs abound, little attention is paid to creating a change in how teachers think and work. Unless we target the thinking and practice of teachers, and offer them sustained assistance, all the new state testing, school-based management policies, reorganizations, and parent centers will prove ineffectual in substantially improving public education. (p. 45)

Schiedler continues to recognize teachers as key to making changes within the school. “Fully equipping teachers to implement reforms is one of the keys to basic change. . . . we must not miss concentrating our efforts on how teachers think and work, on the central role of teachers and their practice” (p. 55). In order to reshape the schools of today, “ We cannot afford to lose the lessons of the past” (p. 55).

Leibensperger and Reising (1994) believe teachers must play an important role in the “design, implementation, and governance of restructured schools” (p. 105). Blount (1995) agreed regarding who should be involved in the decisions about student learning:

> It is seen as a top-down management where teachers have little voice in any of the structural components of space, time, student organization and arrangement (people), or curriculum . . . The argument is that for restructuring to be successful,

> teachers need to be more involved in decision making regarding student learning. (p.201)

Teacher Morale and Relationships

Another aspect that has an effective impact on students and the academic achievement involves the relationships among educators and teacher morale. Teachers are overworked, inundated with excess demands of teaching new content and standards, and taking care of the emotional needs of students. Lumsden (1998) relates four specific factors that affect teacher morale: 1) school environment; 2) parent support; 3) student responsiveness and enthusiasm; and 4) stress. It is further explained that student learning, achievement, and personal health are reasons to maintain a high morale. To maintain a positive morale, Lumsden shared the need for teachers and administrators to recognize morale status and take action as needed. She concluded:

> Although teachers can take steps individually to preserve their professional satisfaction and morale, they must also be nurtured, supported, and valued by the broader school community. When teachers are provided with what they need to remain inspired and enthusiastic in the classroom, students as well as teachers will be the beneficiaries. (p. 2)

Houchard (2005) studied teacher morale along with principal leadership practices using the *Purdue Teacher Opinionaire (PTO),* the *Leadership Practices Inventory (LPI),* and the North Carolina End-of-Grade/End-of-Course tests. Findings indicated, “As found consistent with most studies and reviews, all factors of morale had positive correlation to student achievement and outcomes” (p. 105). Rowland (2008) also examined the relationship between the morale of teacher and the principal at the middle school level.

After an in-depth examination of the results also between the LPI and the PTO, Rowland implied the importance of a principal's behavior has an impact on the school's environment which includes the teachers.

Articles and reports often indicate the need for teachers' input into the decisions made within a school. Jones (2000) investigated the correlation between teacher empowerment and teacher morale with 250 elementary teachers. Results indicated the teachers' desire to be involved in the decisions, thus increasing teacher morale. There were significant differences found between the frequency of teacher participation and morale; teachers' desires to participate and frequency of participation; as well as, desire to participate with teacher morale. This study was in agreement with Jones, (1997) who surveyed 400 teachers and concluded, "Teachers and schools with higher participation reported higher morale" (p.76).

In Georgia, Lloyd (2006) was concerned with the demands of the new GPS on teacher morale. Using the *Purdue Teacher Opinionaire,* 180 teachers surveyed had no significant relationship between morale and the quality of the GPS. However, it was noted, "Teachers who perceived the Georgia Performance Standards as being high in quality tended to have higher levels of morale" (p. 90).

In an effort to deemphasize the pressures of *No Child Left Behind,* Million (2005) suggests the following ways for administrators to boost teacher morale:

1. Protect them—focus on positive things, not the negative ones.
2. Empower them—include teachers in problem-solving and decision-making processes.

3. Equalize the stress—procure funding for materials, supplies, and teacher attendance at workshops.
4. Use humor and praise—daily tidbits provide a positive morale.
5. Believe in them—trust them as they attempt new strategies and skills.
6. Respect them—relationship at its best.
7. Speak up for them—take teacher concerns to someone at a higher level who can 'fix the problem'.
8. Show movies—do the little things to promote a positive atmosphere.
9. Pile on the perks—reward with luncheons, notes, certificates, and host conferences to explain the school changes.

Million continues with other suggestions from various principals through the use of state monies. Principals show appreciation and at the same time build morale by letting the teachers know they are appreciated.

In a teacher leadership qualitative case study, Briley (2004) concluded teachers' perceptions concerning empowerment is highly influenced by the school's administration thus affecting student achievement. "Impacting student learning is the primary reason why teachers need to be empowered as leaders of change at their schools" (p. 167).

Another researcher, Johnson (2006) also studied an elementary principal in a quantitative and qualitative case study. The following issues and themes became prevalent in the study as the principal sought to promote teacher leadership in "fostering teacher professionalism, teacher job satisfaction and student academic achievement at the school" (p. ii):

1. Teachers perceive that teacher leadership is beneficial to promoting their professional development.

2. Teachers perceive that teacher leadership is vital to job satisfaction.

3. Opportunities for teacher leadership roles are available to teachers.

4. Teachers feel there is a need for teacher leadership.

5. Teacher leadership is beneficial to principals in their management job.

6. Teacher leadership is implemented effectively in schools.

7. Some teachers feel that while some teachers are given teacher leadership opportunities, others are left out.

8. Teachers perceive that teacher leadership is important to student achievement. (p.132)

Shared Decision Making

Principal, Joanne Rooney (2004), believes principals no longer make decisions alone. “Teachers have become decision makers, too, and principals would be wise to involve them in every way possible in resolving the issues they face daily” (p. 84). Rooney continues to encourage principals to have faith in teachers and rely upon them for important school decisions. “After all, we entrust teachers each and every day with our kids—our most cherished responsibilities. We must also trust teachers to make the organizational decisions that affect their own lives and the lives of students” (p. 85).

While considering the teacher role in making decisions at the school level, Enderlin-Lampe (2002) believes a key factor in the restructuring of schools involves the teacher. Some teachers want to be involved while others want less involvement. Shared

decision making is one major component when considering the changes to be made in a school.

Teacher empowerment, morale, and relationships that involve trust are necessary components of teacher leadership. These attributes align with improved student achievement as concluded by Johnson (2006).

> The greatest reward of the teacher leadership educational approach goes to the students, who have considerably improved educational achievement when teacher leadership is implemented in their school. Through teacher leadership, educators obtain knowledge, self-confidence and a sense of professionalism, which positively impacts the education of students. By students seeing teachers that have the status of leaders, it influences students' self-confidence that they take into adulthood. Teacher leadership improves teachers' instructional strategies and creates a culture of learning throughout the school. In the survey of this document approximately 90 percent of teachers tended to agree that teacher leadership improves students' educational achievement. The teacher leadership educational approach promotes teachers' accountability for being effective teachers in the classroom. When teachers see themselves as professionals, they carry this positive, intelligent attitude to the classroom and influence their students to become intellectual thinkers, which stays with them into adulthood. Teacher leadership ensures that classrooms do not become holding tanks for children, like baby-sitting. When teachers learn and grow more knowledgeable, they learn to love learning, and want others to learn well, specifically their students. Teacher leaders gain more in-depth, intellectually vibrant understanding and concepts of

> the world. With teacher leadership schools become learning centers that prepare children educationally for the challenges of this changing world. (pp. 137-138)

Summary of the Literature Review

The review of literature examined the theoretical/conceptual framework of the two popular organization structures for the elementary school—traditional and departmentalized. Many researchers agree with the theoretical/conceptual framework surrounding the historical traditional, one teacher, self-contained classroom. It was organized and implemented out of consideration for the 'whole child' with the need for a personal relationship between the teacher and the student. (Ackerlund, 1959; Anderson, 1962; Bahner, 1965; Bezeau, 2007; Bowser, 1984; Canady & Rettig, 2008; Garcia, 2007; Heathers, 1960; Legters, McDill & McPartland, 1993; Lobdell & van Ness, 1963; Naumann, 1977; Patton, 2003; Walters, 1970).

In the most recent book *Elementary School Scheduling*, Canady & Rettig (2008) supports the traditional classroom model with one exception:

> Given ideal circumstances . . . teachers who have a strong content knowledge and pedagogical skills in all subject areas, deep understanding of child development, a caring soul, and an abiding belief that all children can learn, we might even favor the self-contained classroom. Certainly, we can recite all the typical arguments for maintaining it, such as a need for young children to have the security and support of one competent, caring adult; but we also must admit that not all self-contained classrooms operated according to the textbook ideal. (p. 127)

Just as Canady and Rettig had concerns in 2008, Wiles and Bondi's (1984) reported that early educators noticed problems with the traditional setting and sought new structures.

These structures ranged from small teams in a semi-departmentalized group to a full departmentalized structure of three to four teachers. With the many differences, Wiles and Bondi addressed the organization and grouping in the elementary school over two decades ago in the following explanation:

> A single pattern of organization or grouping arrangement should not be used in a school. A sound approach is to organize and group according to the needs of the students, abilities of the teachers, and availability of facilities and resources. No single pattern fits all situations. (p. 285)

Using the chronological student achievement results reported in this chapter to support the traditional and departmentalized structure, findings have been inconsistent. It is evident neither structure has shown sustained significant differences. Results favored both types of organizational structures.

One additional aspect found in Johnson's (2006) and Enderlin-Lampe's (2002) research findings referred not only to the specific students' academic achievement findings, but to the importance of teachers being considered in the individual school's decision. To maintain a positive morale, Lumsden (1998) shared the need for teachers and administrators to recognize morale status and take action as needed. She concluded:

> Although teachers can take steps individually to preserve their professional satisfaction and morale, they must also be nurtured, supported, and valued by the broader school community. When teachers are provided with what they need to remain inspired and enthusiastic in the classroom, students as well as teachers will be the beneficiaries. (p. 2)

Given the above research and literature findings of several researchers—Alspaugh and Harting, Bowser, Garcia, Garrigan, Harris, Lamme, McGrath and Rust, Scheidler, and Williams—conflicting results indicates all schools are not the same; differences are evident among teachers, students, and academic demands; and, some changes are being attempted to meet the pressing needs of all students. There is a continued need for exploration between student achievement and its relationship to the different organizational structures for the elementary school students with an insight into teacher leadership (Alspaugh & Harting, 1995; Bowser, 1984; Garcia, 2007; Harris, 1996; Lamme, 1976; McGrath & Rust, 2002; Scheidler, 1994; Wiles & Bondi, 2001; Williams, 1999).

CHAPTER 3: METHODOLOGY

The purpose of this chapter is to explain the methods used to complete the quantitative research study. As previously mentioned this study examined which organizational structure, traditional (self-contained, one teacher for all academic subjects) or departmentalized (math taught by a different teacher), had the greatest effect on general fifth-grade students' math achievement as measured by the Georgia CRCT. A secondary purpose addressed the consideration of teachers' perceptions and opinions when making the organizational decision.

From the above problem areas, the following research questions and hypotheses were developed and addressed:

Research Question 1: Do general education fifth-grade students have a higher percentage of students passing the minimum state expectations with a performance level of two (2) or three (3) on the 2007 Georgia mathematics CRCT in a traditional (self-contained, one teacher for all academic subjects) classroom or in a departmentalized (math taught by a different teacher) classroom setting?

Null Hypothesis 1-H_{01}: There will be no significant difference in mathematics achievement of traditional, self-contained (one-teacher for all academic subjects) fifth-grade general education students as compared to departmentalized (math taught by another teacher) fifth-grade general education students as shown by the percentage passing results of the 2007 Georgia CRCT mathematics scores.

Research Question 2: Do general education fifth-grade students have a higher mean scale score on the 2007 Georgia mathematics CRCT in a traditional classroom than fifth-grade students in a departmentalized classroom setting?

Null Hypothesis 2-H_{02}: There will be no significant difference in the mathematics achievement of traditional (self-contained, one-teacher for all academic subjects) fifth-grade general education mathematics students as compared to departmentalized (math taught by different teacher) fifth-grade general education mathematics students as shown by the mean scale score on the 2007 Georgia CRCT mathematics scores.

Research Question 3: Do general education fifth-grade students have a higher percentage of students passing the minimum state expectations with a performance level of two (2) or three (3) on the 2008 Georgia mathematics CRCT in a traditional (self-contained, one teacher for all academic subjects) classroom or in a departmentalized (math taught by a different teacher) classroom setting?

Null Hypothesis 3-H_{03}: There will be no significant difference in mathematics achievement of traditional, self-contained (one teacher for all academic subjects) fifth-grade general education students as compared to departmentalized (math taught by another teacher) fifth-grade general education students as shown by the percentage passing results of the 2008 Georgia CRCT mathematics scores.

Research Question 4: Do general education fifth-grade students have a higher mean scale score on the 2008 Georgia mathematics CRCT in a traditional classroom than fifth-grade students in a departmentalized classroom setting?

Null Hypothesis 4 – H_{04}: There will be no significant difference in the mathematics achievement of traditional (self-contained, one teacher for all academic

subjects) fifth-grade general education mathematics students as compared to departmentalized (math taught by different teacher) fifth-grade general education mathematics students as shown by the mean scale score on the 2008 Georgia CRCT mathematics scores.

Research Question 5: Which organizational structure do fifth-grade teachers prefer for the instruction of fifth-grade students?

Research Question 6: Do teachers have a voice in the school-based decision of determining the organizational structure for fifth-grade students?

Research Question 7: Do teachers believe their initial college training adequately prepared them to teach all core subjects at the fifth-grade level?

Research Questions #5, #6, and #7 are addressed by the teacher responses on the Data Collection and Opinion (DCO) Instrument. Results are compiled, tabulated, and reported by percentages of response items.

The methodology section, chapter three, includes the following components: (a) research design; (b) subjects; (c) instruments; (d) procedures; and (e) methodology summary.

Research Design

A causal-comparative research design was used to test the null hypotheses in this ex-post facto research study. Because the participants were predetermined by the participating schools, students could not be randomly assigned by the researcher. The researcher examined the archival data of two different classroom organizational instruction techniques—traditional (self-contained, one teacher) and departmentalized formats (math taught by a different teacher). This procedure was accomplished by

analyzing the 2007 and 2008 CRCT mathematical achievement data of the fifth-grade students to investigate the cause-and-effect relationships of the two different types of instructional techniques (independent variables), as measured by the Georgia CRCT (dependent variable). According to Ary, et al. (2006), this design will look "at the consequences of differences on an independent variable" (p. 360).

Extraneous variables involving teachers' experiences, perceptions, and opinions about the classroom organization were other areas of concern. These variables were addressed using a teacher data collection and opinion instrument to be discussed later in this chapter.

Subjects

All fifth-grade students within the state of Georgia represented the population for this study. The primary participants for the research study were fifth-grade students from a regional educational service agency which serves 13 school systems within a 12-county area in northeast Georgia. Students were served during the 2006-2007 and 2007-2008 school years in 57 different schools in the present RESA district of 59 elementary schools. Two of the 59 schools were newly opened in the fall of 2008 and had no archival 2007 or 2008 CRCT data. However, the students' scores were embedded in the other school scores within the districts. Most RESA schools were located in the rural areas of a county while others were situated in urban areas. Total student enrollments (TSE) of the school systems varied from approximately 1,200 students to 25,000 students in pre-kindergarten through twelfth grade. The economically disadvantaged student (ED) percentages (students received free or reduced lunches), students with disabilities (SWD), and English Language Learners (ELL) in all systems were similar with the exception of

system # 11 for the ED and ELL totals. The number of elementary schools (NES) varied: three school systems had only one elementary school; eight systems ranged between two and five elementary schools; and, the two largest systems had eight and 21 elementary schools as shown in Table 1.

Table 1

13 School System Comparisons in 2008

System	TSE	% ED	% ELL	% SWD	NES
1	1,177	47	1	9	1
2	2,339	56	6	11	1
3	2,659	50	2	17	2
4	2,775	54	4	15	1
5	3,318	32	2	11	3
6	3,579	52	2	10	3
7	3,838	46	1	12	3
8	3,842	50	2	10	4
9	3,849	44	3	13	3
10	4,111	50	1	14	4
11	5,936	72	29	8	5
12	6,740	48	7	14	8
13	25,461	51	5	10	21

Students identified as having special needs, such as a reading or math disability, and other types of needs as identified by the state were excluded from the study. This exclusion is due to the fact that every SWD student had an individualized educational

plan with specific modifications and accommodations such as the use of calculators, additional time, or someone reading the tests to them. These accommodations may have interfered with the test data since resource support was often available to them beyond the general classroom setting.

Secondary participants were the 240 general education teachers employed by the 13 school systems representing 57 elementary schools. Even though two elementary principals permitted the researcher to use the student data, they opted out of the survey for the teachers within their respective schools.

Instruments

Two instruments used to measure student achievement and teacher experiences, perceptions, and opinions were the annual state-mandated Georgia CRCT and the researcher-developed Data Collection and Opinions for Teachers.

Georgia CRCT

The CRCT Fifth Grade Mathematics Test was used to measure the math achievement of the fifth-grade students participating in the study and addresses *Research Questions 1* and *2*. As an established measurement for student achievement, the validity and reliability issues are necessary.

In *An Assessment and Accountability Brief* by the Georgia Department of Education (GaDOE) (2008), the key issues of validity are addressed in the vigilant "documentation of the test development process" (p. 1). The following pieces of evidence are summarized to describe the in-depth steps involved in developing a valid instrument for the state of Georgia through the CRCT.

1. Clear identification of the purpose of the test which is used to measure the mastery of the state's curriculum. Purposes included the tests would measure the performance in grades one through eight in reading/language arts, and mathematics. The tests further included science and social studies for grades three through eight. Also, goals to identify the areas that need improvement meet the requirements of the *No Child Left Behind Act* and weigh the overall quality of Georgia's education. Finally, stakeholders would be informed of the progress toward meeting the state's academic achievement standards for the individual student, class, school, system, and state levels.
2. Committees of educators reviewed the curriculum to "indicate which standards can and will be measured and how they will be represented on the assessment" (p. 2).
3. Content domain specifications were developed and posted on the GaDOE website as the CRCT Content Descriptions. These descriptions informed all stakeholders of the test's content and assessment method. Also, a 'content weight' document showed the percentage of items to be tested per domain on each content test.
4. Test items were written by "qualified, professional assessment specialists specifically for Georgia tests" (p. 2). Committees reviewed items by accepting, revising, or rejecting. Items were field tested "by a representative group of motivated students under standard conditions" (p. 2).
5. Another Georgia committee reviewed all items with correct and incorrect responses after the field test. Performance analyses of different groups of

students' responses were examined for potential bias. Item acceptance, revision, and/or rejection were done once again.

6. Development of actual test in various forms along with careful consideration of both content and statistical data were completed to make sure all test forms were of equal difficulty.
7. Following the first test administration, a standard-setting process had to take place. This process was accomplished by educators who decided what number of items must be correct in order to meet or exceed the standards.
8. The final step was "to produce scores and distribute results" (p. 3).

CRCT scores are reported as scale scores and performance levels as shown in Table 2. Results can be consistently and meaningfully interpreted by the stakeholders through the interpretive guide that is distributed with all tests results. Does not meet expectations (DNM), meets expectations (ME), and exceeds expectations (ES) are the codes used below.

Table 2

QCC and CRCT Scale Score Ranges and Performance Levels

	DNM	ME	EE
QCC scale score	Below 300	300 - 349	350 or above
GPS scale score	Below 800	800 - 849	850 or above
Performance level	1	2	3

The GaDOE attended carefully to the test development process as listed above to ensure the CRCT was a valid instrument. "The CRCT contractors produce documentation

of each phase of the test development process and produce various pieces of evidence. . . . The department has also conducted analyses as evidence of external validity by comparing how the constructs the CRCT measure compare with other well-recognized assessments (e.g., ITBS)" (Georgia Department of Education, An Assessment and Accountability Brief, 2008, p. 3).

While an instrument's validity is highly important, it must also have a high degree of reliability according to the GaDOE Assessment and Accountability Briefs (2007, 2008). For the Georgia CRCT, two indices are reported for reliability. Cronbach's alpha reliability coefficient is the first index reported. "A reliability coefficient expresses the consistency of test scores as the ratio of true score variance to observed total score variance. . . . Cronbach's alpha measures the internal consistency over the responses to a set of items measuring an underlying unidimensional trait" (p. 4). Using Crocker and Algina's formula, the reliability coefficient (Cronbach's alpha) is computed for the 2007 and 2008 CRCT math to equate to .92 for fifth grade mathematics. The standard error of measurement (SEM) is the second statistical index used to describe the reliability for the CRCT. Reliabilities and SEMs for the 2007 and 2008 CRCT suggest that the CRCT assessments are sufficiently reliable and are consistent with administrations in previous years for the intended purpose which offers a reliable depiction of student performance for the 2007 and 2008 CRCT.

In contrast to the SEM which expresses a raw score unit, a further explanation of reliability for the Georgia CRCT is the conditional standard error of measurement (CSEM). The CSEM is articulated to the "degree of measurement error in scale score units and are conditioned on the students' score" (GaDOE Assessment and

Accountability Brief, 2008, p. 5). Specific CSEMs use the cut scale scores to identify the performance levels. For fifth-grade math, the following 2007 and 2008 CSEMs, presented in Table 3, are required to have a performance level of two (2) to meet the expectations and to exceed expectations with a performance level of three (3).

Table 3

2007 & 2008 Fifth-Grade Math Cut Scores

	CSEMs Math Scale Cut Scores	
Year	Meets	Exceeds
2007 - QCC	7	9
2008 - GPS	9	11

The CSEMs are consistent with prior test administrations thus indicating the scores "are well estimated and provide an accurate picture of student performance. . . . The various reliability indices for the CRCT indicate that the test provides consistent results and that the various generalizations of test results are justifiable. These strong indicators of reliability also support the tests claim for validity" (GaDOE Assessment and Accountability Brief, 2008, pp. 6-7).

Data Collection and Opinions (DCO) for Teachers Instrument

The researcher modified Bowser's (1984) teacher survey and developed an instrument to strengthen the research study. The review of literature revealed several aspects concerning teachers' perceptions and input into the decision-making at the school level. This instrument concentrated on the teacher variables and addressed *Research Questions #5, #6,* and *#7* which might further impact the mathematics achievement of fifth-grade students (See Appendix A).

To address the validity of the DCO instrument, Ary, et.al. (2006) suggested the necessity of content validity which is based on relations to a criterion as well as face validity to focus on essential, meaningful, and appropriate survey items:

> The most obvious type of scientific validity evidence is based on content which can be gathered by having some competent colleagues who are familiar with the purpose of the survey examine the items to judge whether they are appropriate for measuring what they are supposed to measure and whether they are a representative sample of the behavior domain under investigation. (p. 440)

To assist with the content and face validity of the DCO instrument, ten competent educators with elementary, middle, and high school experience, not involved in the study, analyzed the instrument. Each educator previewed the instrument for appropriateness of questions, clarity of directions, and understanding of the topics being presented. The educators examining the DCO instrument provided feedback and suggested minor revisions. Instrument changes were made and the researcher sought committee and IRB approval before the electronic administration of the instrument to all fifth-grade general education teachers in the participating schools. Experiences of educators assessing the DCO instrument ranged between first-grade teachers to several middle school teachers which have taught or are teaching various subjects. The assessors also included two administrators and three retired educators. Table 4 displays the expert qualifications of the educators piloting the DCO instrument.

Table 4

Educator Qualifications for DCO Validation

#	Previous employment positions	Grade level(s) experience(s)	Present employment positions
1	Teacher and Administrator	Kindergarten – 5th grade	Retired; Educational Consultant
2	Teacher and Administrator	Middle and High School	Retired; College Professor & Graduate Coordinator
3	Teacher	1st , 3rd, & 5th grade	Retired; Part-time Teacher: 3rd – 5th grade
4	Teacher	4th – 7th grade	4th grade – all subjects
5	Teacher	4th – 5th grade	Physical Education teacher
6	Teacher	4th – 5th grade	4th grade – all subjects
7	Teacher	6th – 9th grade Math; Home Economics	Educational Consultant
8	Teacher	5th – 6th grade	6th grade – language arts
9	Teacher	3rd, 4th, & 6th (Math and Science)	3rd grade – all subjects
10	Teacher	4th – 6th grade	6th grade – math

Procedures

Prior to institutional review board (IRB) application, the researcher requested permission from the director of RESA and the RESA Board of Control (BOC) (which consists of all the system superintendents) to conduct the study within the RESA district (Appendix B). After approval from the institutional review board (IRB) (Appendix C) and the RESA director and BOC, (Appendix D), the researcher made personal contact with the 13 school superintendents to verify permission to contact the elementary principals. Each of the 59 principals within the RESA area agreed to allow their fifth-grade teachers to participate and initialed a principal consent form (See Appendix E). In addition to the principal's consent, 57 of the 59 principals provided an email address for a fifth-grade contact person within their school. The contact persons served as liaisons between the school and the researcher since new administration at numerous schools were often unaware of structures used at the school in previous years. The contact persons were contacted via email to verify the type of organizational structure utilized by the fifth-grade classrooms during the 2006-2007 and 2007-2008 school years. These types were identified as using either traditional (self-contained, one teacher) or a departmentalized (math taught be a different teacher) setting. In addition, the contact person was asked to submit the number of general education fifth-grade teachers at the respective school (See Appendix F).

The researcher obtained historical test data from the Georgia Report Card from the GaDOE website. Table 5 shows the RESA district's fourth grade overall mathematics 2007 CRCT mathematics scores prior to the specific organizational classroom instruction at the fifth-grade level from the 13 systems which encompasses the 57 participating schools. These scores represent the same students being compared in 2008. However,

students were taught and tested using the previous QCC curriculum rather than the new GPS curriculum in the spring of 2007.

Table 5

2007 CRCT Fourth Grade Tested Students with Percentage Passing

System	# 4th grade tested 2007	% 4th grade passing: Met or exceeding—(QCC)
1	82	87
2	208	86
3	242	93
4	212	74
5	250	82
6	279	70
7	293	75
8	245	79
9	279	86
10	286	91
11	476	79
12	514	74
13	2,036	67
Totals/Average	5,402	80%

The 2007 fifth-grade math CRCT scores were also based on the QCC rather than the new GPS. The Georgia Report Card was again used to determine the number of fifth-

grade students tested and the percent passing as shown in Table 6. This table is presented for comparison and may assist with the internal validity of the study.

Table 6

2007 and 2008 Fifth-Grade Comparisons

System	# 5th grade tested – 2007	% 5th grade passing: Met or exceeding (QCC)	# 5th grade tested – 2008	% 5th grade passing: met or exceeding (GPS)
1	94	93	87	79
2	149	92	201	80
3	170	96	246	86
4	221	80	234	72
5	281	92	265	69
6	292	85	270	67
7	296	92	288	77
8	284	92	253	68
9	296	93	270	82
10	307	96	293	86
11	487	88	489	70
12	492	90	534	66
13	1,950	83	2,008	69
Totals/Average	5,319	90%	5,438	75%

To maintain anonymity with the DCO responses, an electronic link to the DCO was sent to the 57 fifth-grade contact persons and requested to forward to other fifth-grade general education teachers within their respective schools (See Appendix F). The teacher-friendly, reasonably priced www.surveymonkey.com website was used.

Data Collection

From the fifth-grade contact person's email responses, a spreadsheet of the identified organizational structure for math from each of the 57 schools was compiled by the researcher. If teacher exceptions were noted by the contact person, comments were indicated by an asterisk on the spreadsheet with the exceptions identified for the data department. All schools teaching in the traditional (self-contained, one teacher for all academic subjects) structure were coded with a 0 while the departmentalized (math taught by a different teacher) options were coded with a 1 (See Appendixes G & H). Even though several schools were departmentalized in science and social studies, they were not included in the departmentalized group since this study only considered math scores. The spreadsheet was submitted to RESA's data analysis department to compile student scores, remove any identifiable student information to insure confidentiality, and find the mean scale scores, standard deviation, and percent passing with a performance level of two (2) or three (3) of each group.

All DCO electronic teacher responses were collected from the www.surveymonkey website and presented in a tabular form. Percentages of responses to each item are summarized and presented in chapter four to address the *Research Questions #5, #6, #7*, and any extraneous variables. Additionally, percentages and comments are used in chapter five.

Statistical Procedures

The data considered was the 2007 and 2008 Georgia fifth-grade performance level and mean scale scores on the mathematics portion of the CRCT. Data analysis was performed using Statistical Package for the Social Sciences software with the descriptive analyses of the mean (M) and standard deviation (SD) using an alpha level of .05 for statistical significance on *t* tests and .005 for *z* scores. After finding the descriptive data, the first statistical procedure used was the *z* score distribution which is, "A standard score that indicates how far a score is above the mean score in terms of standard deviation units" (Ary, et.al. p. 640). The sample of 2,487 traditional students was compared with the 2,162 departmentalized students in 2007 to address *Research Questions #1.* In 2008 2,282 traditional students were compared with 2,455 departmentalized students and addressed *Research Question #3.*

The second statistical test performed by the researcher was a two-sample *t-test* which compared the mean scale scores differences between the traditional students and the students that were taught in departmentalized settings. These results addressed *Research Questions #*2 and *#4* using the same student numbers in *Research Questions #1* and *#2.*

The electronic results from the teacher DCO instrument are presented in Tables 11, 12, 13, and 14 by "determining the frequencies and percentages of responses for the questions of the study" (Ary, et.al. 2006, p.440). The first ten questions provide background information and opinions of the teacher respondents. DCO item numbers 11, 12, and 13 are used to answer *Research Questions #*5, #6, and #7 while the remaining

DCO responses and comments in item # 15 add clarity to the extraneous variables which might interfere with the statistical findings of the CRCT data.

Methodology Summary

Fifth-grade students within the state of Georgia represented the population for this study. The research sample of fifth-grade students was based upon the 59 elementary schools' willingness to participate. With assistance from the district's superintendents, principals, and fifth-grade contact persons, fifth-grade classes were identified as having been organized in the traditional or departmentalized settings during the 2006-2007and 2007-2008 school years. The archived CRCT data were divided into two specific levels, students taught in a traditional classroom or students taught in a departmentalized classroom. All students identified with special needs were excluded from the study.

Using the fifth-grade math scores, *z* scores were used to compare the passing percentages with a performance level of two (2) or three (3). A two-sample *t test* was used to determine significant differences between mean scale scores of the traditional (self-contained, one-teacher) classroom of students and the departmentalized students. All statistical analyses were performed using SPSS software. The study describes the mean and standard deviation using an alpha level of .05 for statistical significance on *t* tests and .005 for *z* scores. These results address *Research Questions #* 1, #2, #3, and #4.

To address teacher perceptions and opinions concerning the organizational structure of the classroom, an anonymous, electronic teacher DCO was administered to all fifth-grade general education teachers within 57 of the 59 participating schools. Findings from the DCO results were compiled, summarized, and presented in Tables 11-14 by reporting the total percentages of item responses and to address *Research*

Questions #5, #6, and #7. Additional teacher responses and comments were used to supplement the CRCT statistical comparisons between the traditional (self-contained, one teacher) and departmentalized (math taught by a different teacher) classroom structures discussed in chapter five.

CHAPTER FOUR: RESULTS

As stated in chapters one and three, the primary purpose of this quantitative study is to determine the effect of the traditional (self-contained, one teacher for all academic subjects) instruction and departmentalized (math taught by a different teacher) instruction upon the mathematics achievement of fifth-grade students. A secondary purpose is to address teachers' perceptions, experiences, and opinions concerning the classroom organizational structure at the fifth-grade level. The results of the 2007 and 2008 Georgia mathematics CRCT of fifth-grade students and the compilation DCO findings of the teachers are reported.

This chapter is organized in three sections. The first section presents the descriptive findings of the students, schools, and teachers. The second section details the student achievement results of the fifth-grade students' Georgia CRCT mathematics scores by the traditional (self-contained, one teacher for all academic subjects) instruction and the departmentalized (math taught by a different teacher) instruction which addresses R*esearch Questions* #1, #2, #3 and #4. The third section reports the teachers' responses to the electronic DCO survey and addresses *Research Questions* # 5, #6, and #7.

Descriptive Findings

Students and Schools

The RESA district served 57 elementary schools during the 2006-2007 and 2007-2008 school years. All fifth-grade classes (100%) were taught in the traditional (self-contained, one teacher for all academic subjects) or departmentalized (math taught by a different teacher) setting as identified in Appendixes G and H.

In 2007, 31 schools (54%) primarily used the traditional structure while 26 schools (46%) were organized in a departmentalized structure. Four schools had teacher exceptions classified in the different organizational setting. The total number of fifth-grade general education students included in the study was 4,649 (87%) of the total 5,319 RESA students tested in the spring of 2007. Of the 4,649 students, the traditional classrooms contained 2,487 (53.5%) general education students while the departmentalized classroom settings comprised 2,162 (46.5%) students (N). A total of 670 (12.6%) SWD students were excluded from the statistical findings due to specific testing modifications.

In 2008, the organizational percentages were reversed. Out of 57 schools, 31 schools (54%) primarily used a departmentalized structure while 26 schools (46%) were mainly structured in the traditional model. Within the schools there were five individual teacher exceptions. The total number of fifth-grade general education students included in the study was 4,737 (87%) of the total 5,438 RESA students tested in the spring of 2008. Of the 4,737 students, the traditional classrooms contained 2,282 (48.2%) general education students while the departmentalized classroom settings comprised 2,455 students (51.8%). A total of 701 SWD students (12.9%) were excluded from the statistical findings due to specific testing modifications.

Teachers

The DCO survey link was sent to 57 (96.6%) fifth-grade contact persons within the 59 schools. Two principals asked to exclude their teachers from the survey. A reported total number of 240 fifth-grade general education teachers received access to the survey link via email. Survey completions were obtained from 180 (75%) of the teachers.

Data Analysis on Academic Achievement - CRCT

The coded list as explained in the data collection section of chapter three was submitted to the RESA data analysis department for the purpose of collecting the descriptive data and maintaining confidentiality of student records. The coded lists as described in this chapter are located in Appendixes G and H. The following sections detail the findings and address *Research Questions* #1, #2, #3, and #4.

Research Question # 1

Do general education fifth-grade students have a higher percentage of students passing the minimum state expectations with a performance level of two (2) or three (3) on the 2007 Georgia mathematics CRCT in a traditional (self-contained, one teacher for all academic subjects) classroom or in a departmentalized (math taught by a different teacher) classroom setting?

During 2007, 2,239 (90.03%) students served in the traditional setting passed the minimum state expectations with a performance level of two (2) or three (3) on the math CRCT. Of the 2,162 departmentalized students, 2,002 (92.60%) passed the minimum state expectations with a performance level of two (2) or three (3) on the math 2007 CRCT as shown in Table 7.

Table 7

2007 Fifth Grade Percentage Passing CRCT Using z Scores

Organizational structure	N	N Pass	% Pass	M	SD	*z*	*p*<
0 - Traditional	2,487	2,239	90.03	334.55	28.46	-3.0905	.005
1 - Departmentalized	2,162	2,002	92.60	334.81	26.90		

Using SPSS, a *z score* for population proportion was performed to determine significant differences between the traditional (self-contained, one teacher for all academic subjects) and the departmentalized (math taught by a different teacher) students. Findings were: z = -3.0905 and p = .002. Therefore, there is evidence for a difference in the proportion of students who passed in the two studied groups of traditional (self-contained, one teacher) and the departmentalized (math taught by a different teacher) students. Therefore, the *Null Hypothesis 1-H_{01}:* There will be no significant difference in mathematics achievement of traditional (self-contained, one-teacher) fifth-grade general education students as compared to departmentalized (math taught by a different teacher) fifth-grade general education students as shown by the percentage passing results of the 2007 Georgia CRCT mathematics scores is rejected.

Research Question #2

Do general education fifth-grade students have a higher mean scale score on the 2007 Georgia mathematics CRCT in a traditional classroom than fifth-grade students in a departmentalized classroom setting?

The 2,487 students (N) served in the traditional (self-contained, one teacher for all academic subjects) setting during 2007 had a mean scale score of 334.55 with a standard deviation of 28.456. The 2,162 departmentalized (math taught by a different teacher) students had a mean scale score of 334.81 with a standard deviation of 26.903. The descriptive data are shown in Table 8.

Table 8

2007 Fifth Grade CRCT Mean Scale Scores Using t-test

Organizational setting	N	M	SD	*t*	*p*>
0 - Traditional	2,487	334.55	28.456	-.32	.05
1 - Departmentalized	2,162	334.81	26.903		

Stevens (1999) described three assumptions of normality, homogeneity of variance, and independence of the observations to consider prior to conducting a *t test*: With normality it is assumed the group's scores on the dependent variable are normally distributed while the homogeneity of variance considers the population variances to be equal for the two groups. Lastly, the independence of the observations regarded each subject's score as not affected by other subjects in the same treatment group on the dependent variable.

Normality is not an issue within this study due of the large sample size of more than 4,000 in both groups during the spring 2007 testing. Homogeneity of variance was assumed equal since the maximum to minimum ratio of the group sizes are less than 1.5 between the traditional and departmentalized groups (2,487 and 2,162, respectively). Subjects within this study were from 57 different schools and classes. Each student's score was not affected by other students within the same treatment group. Therefore, one can assume the achievement levels appear to be independent.

Using SPSS, a two-sample *t test* was performed to determine significance. No significant difference was noted between the groups ($t(4,649) = -.32$, $p = .749$). Therefore, the *Null Hypothesis 2-*H_{02}*:* There will be no significant difference in the

mathematics achievement of traditional (self-contained, one-teacher) fifth-grade general education mathematics students as compared to departmentalized (math taught by different teacher) fifth-grade general education mathematics students as shown by the mean scale score on the 2007 Georgia CRCT mathematics scores is retained.

Research Question # 3

Do general education fifth-grade students have a higher percentage of students passing the minimum state expectations with a performance level of two (2) or three (3) on the 2008 Georgia mathematics CRCT in a traditional (self-contained, one teacher for all academic subjects) classroom or in a departmentalized (math taught by a different teacher) classroom setting?

Students served in the traditional (self-contained, one teacher) setting had 77.48 % passing the minimum state expectations with a performance level of two (2) or three (3) on the math 2008 CRCT. The departmentalized (math taught by a different teacher) students 77.23 % passing the minimum state expectations with a performance level of two (2) or three (3) on the math 2008 CRCT as shown in Table 9.

Table 9

2008 Fifth Grade Percentage Passing CRCT Using z Scores

Organizational structure	N	N Pass	% Pass	M	SD	*z*	*p*<
0 - Traditional	2,282	1,768	77.48	828.45	37.26	.2019	.005
1 - Departmentalized	2,455	1,896	77.23	827.91	37.19		

Using SPSS, a *z* score for population proportion was performed to determine significant differences between the traditional (self-contained, one teacher) and the departmentalized (math taught by a different teacher) students. Findings were: $z = .2019$ and $p = .84$. Therefore, there is no evidence for a difference in the proportion of students who passed in the two studied groups of traditional and the departmentalized students.

The *Null Hypothesis 3-H_{03}:* There will be no significant difference in mathematics achievement of traditional, (self-contained, one-teacher) fifth-grade general education students as compared to departmentalization (math taught by a different teacher) fifth-grade general education students as shown by the percentage passing results of the 2008 Georgia CRCT mathematics scores is retained.

Research Question #4

Do general education fifth-grade students have a higher mean scale score on the 2008 Georgia mathematics CRCT in a traditional classroom than fifth-grade students in a departmentalized classroom setting?

Students served in the traditional (self-contained, one teacher) setting during 2008 had a mean scale score of 828.45 with a standard deviation of 37.26. The departmentalized (math taught by a different teacher) students had a mean scale score of 827.91 with a standard deviation of 37.19. The descriptive data are shown in Table 10.

Table 10

2008 Fifth Grade CRCT Mean Scale Scores Using t-test

Organizational setting	N	M	SD	*t*	*p*>
0 - Traditional	2,282	828.45	37.26	.4989	.05
1 - Departmentalized	2,455	827.91	37.19		

Three assumptions by Stevens (1999) to consider prior to conducting a *t test* were also addressed in 2008. Normality was not an issue because of the large sample size in both groups. Homogeneity of variance was assumed equal since the maximum to minimum ratio of the group sizes are less than 1.5 between the traditional and departmentalized groups (2,282 and 2,455, respectively). Since subjects within this study were from 57 different schools and classes, each student's score was not affected by other students within the same treatment group. Therefore, one can possibly assume the achievement levels appear to be independent during 2008.

Using SPSS, a two-sample *t test* was performed. No significant difference was noted between the groups ($t(4737) = .4989$, $p = .6179$). Therefore, the *Null Hypothesis 4-* H_{04}*:* There will be no significant difference in the mathematics achievement of traditional (self-contained, one-teacher) fifth-grade general education mathematics students as compared to departmentalized (math taught by different teacher) fifth-grade general education mathematics students as shown by the mean scale score on the 2008 Georgia CRCT mathematics scores is retained.

Data Collection and Opinion (DCO) Results

To address teacher perceptions and opinions concerning the organizational structure of the classroom, an anonymous, electronic teacher DCO was administered to all fifth-grade general education teachers within 57 of the 59 participating schools. The electronic link was sent to the 57 fifth-grade contact persons via an email. The contact person completed the survey and forwarded the link to the other fifth-grade general education teachers within their respective schools. Teachers had a time span of two

weeks to complete the survey. The total number of fifth-grade general education teachers reported to the researcher was 240. One hundred eighty out of 240 respondents (75%) of the fifth-grade general education teachers responded. The findings of the DCO results are compiled and presented below in Table 11 with questions, response percentages, and number of responses per item.

Table 11

DCO Questions with Response Percent and Number of Responses

#	Question	Response %	# of Responses
1	I have read the above information explaining your voluntary participation and confidentiality rights.	98.0%	177
	Only three (2%) teachers did not check they had read the information.	Item #1 Narrative Summary	
2	How many years of teaching experience?	Response %	# of Responses
	Less than 5 years	20.0%	36
	5 to 10 Years	29.4%	53
	11-15 Years	19.4%	35
	16+ Years	31.1%	56
	Veteran teachers with 16 or more years comprised the greatest percentage of survey participants.	Item #2 Narrative Summary	

3	How many years of teaching experience at 5th grade?	Response %	# of Responses
	Less than 5 years	52.2%	94
	5 to 10 Years	29.4%	53
	11-15 Years	9.4%	17
	16+ Years	8.9%	16
	Teachers with less than five years experience at fifth-grade level completed the survey.	Item #3 Narrative Summary	

4	What is your teaching certificate level?	Response %	# of Responses
	T-4 or PBT-4	25.6%	46
	T-5 or PBT-5	45.6%	82
	T-6 or PBT-6	27.2%	49
	T-7or PBT-7	1.7%	3
	Other	2.8%	5
	The majority of the fifth-grade general education teachers have at least a Master's degree (T-5 or PBT-5).	Item #4 Narrative Summary	

5	What is your certification field? (Click all that apply)	Response %	# of Responses
	Early Childhood (P-5)	93.9%	169

	Middle Grades (4-8) Language Arts	27.8%	50
	Middle Grades (4-8) Reading	18.9%	34
	Middle Grades (4-8) Math	20.6%	37
	Middle Grades (4-8) Science	15.6%	28
	Middle Grades (4-8) Social Studies	27.8%	50
	*Other	15.4%	37
	More teachers (93.9%) are certified in Early Childhood (P-5) than any other certification field.	Item #5 Narrative Summary	
6	Do you have any of the following endorsements? (Click all that apply)	Response %	# of Responses
	Early Childhood Math	8.3%	15
	Gifted	13.9%	25
	Early Childhood Reading	18.9%	34
	ESOL	8.3%	15
	TSS (Teacher Support Specialist)	17.8%	32
	None	51.1%	92
	Slightly more than half (51.1%) of the general education fifth-grade teachers do not have any type of teaching endorsement on their teaching certificate.	Item #6 Narrative Summary	
7	Have you had any specific college-level	Response %	# of Responses

	content training in the area of math beyond what was required for your undergraduate degree? (Click one)		
	YES	31.1%	56
	NO	68.9%	124
	*If yes, approximately how many college-level content courses?	22.0%	53
	Approximately one third (31.1%) of the fifth-grade teachers have had college-level math content training since initial certification.	Item #7 Narrative Summary	
8	Have you had any specific workshops or pedagogical (strategies and/or skills) training in the area of math beyond what was required for your undergraduate degree? (Click one)	Response %	# of Responses
	YES	55.0%	99
	NO	45.0%	81
	*If yes, approximately how many workshops or training classes in pedagogical, math strategies?	38.8%	93
	Over one half (55%) of all fifth-grade	Item #8 Narrative Summary	

	teachers have had specific pedagogical, math strategy training classes since the initial undergraduate degree.					
9	Rank the core subjects from (1) the one you MOST ENJOY teaching to (4) the one you LEAST ENJOY teaching.		Most Enjoy 1	2	3	Least Enjoy 4
	Reading/Language Arts	Response %	31.7%	23.3%	23.3%	21.7%
	Reading/Language Arts	Response #	57	42	42	39
	Mathematics	Response %	39.4%	20.6%	21.7%	18.3%
	Mathematics	Response #	71	37	39	33
	Science	Response %	11.7%	25.6%	30.0%	32.8%
	Science	Response #	21	46	54	59
	Social Studies	Response %	17.2%	30.6%	25.0%	27.2%
	Social Studies	Response #	31	55	45	49
	The subjects most enjoyed by fifth-grade teachers are math (39.4%) and reading (31.7%) while social studies and science are the least enjoyed (27.2% and 32.8%).			Item #9 Narrative Summary		

10	Rank the core subject areas from (1) the one you feel MOST QUALIFIED to teach to (4) the one you feel LEAST QUALIFIED to teach.		Most 1	2	3	Least 4
	Reading/Language Arts	Response %	41.5%	23.3%	17.0%	18.2%
	Reading/Language Arts	Response #	73	41	30	32
	Mathematics	Response %	38.9%	29.1%	15.4%	16.6%
	Mathematics	Response #	68	51	27	29
	Science	Response %	5.7%	23.0%	35.1%	36.2%
	Science	Response #	10	40	61	63
	Social Studies	Response %	15.7%	24.2%	31.5%	28.7%
	Social Studies	Response #	28	43	56	51
	Fifth-grade teachers feel most qualified teaching the reading/language arts (41.5%) and math (38.9%) subjects while social studies and science are the subjects they feel least qualified to teach (28.7% and 36.2%).			Item #10 Narrative Summary		

Items 11 - 13 will be reported later in this section to address *Research Questions #5, #6,* and *#7.*

14	Do you believe teachers who have specialized training in a specific subject	Response %	# of Responses

	area can better serve students through some type of departmentalization at the fifth grade? (Click one)		
	YES	89.4%	161
	NO	10.6%	19
	Fifth-grade teachers believe teachers who have had specialized training in a specific subject area can better serve fifth-grade students in some type of departmentalized setting (89.4%).	Item #14 Narrative Summary	
*15	If you would like to describe your present teaching structure or any additional comments, please use the box below.	Response %	# of Responses
	* Comments are summarized and additional information from question #7 and #8 are explained in chapter five.	34%	61

Research Question #5

Which organizational structure do fifth-grade teachers prefer for the instruction of fifth-grade students? According to the DCO question # 11, 136 out of 180 (75.6%) fifth-grade general education teachers prefer the departmentalized classroom organization for fifth-grade students. Forty-four teachers (24.4%) prefer the traditional (self-contained, one teacher for all academic subjects) structure.

Table 12

Organizational Structure Preferences of Fifth-Grade Teachers

Question # 11	What is your preference for the classroom organizational structure for fifth-grade students? (Click one)	Response %	# of Responses
	Traditional	24.4%	44
	Departmentalization	75.6%	136
	*Other	5.0%	9
	Departmentalization is the most preferred organizational structure for fifth-grade students (75.6%)	Item #11 Narrative Summary	

In addition to the preferences indicated above, nine (5%) of the 180 teachers suggested other options. These options included:

- Team teaching (four teachers)
- Teams—changing for only one subject each day (two teachers)
- Flexible grouping—students move among teachers according to pre-assessments per unit (two teachers)
- Both structures—according to the makeup of the classroom

Research Question #6

Do teachers have a voice in the school-based decision of determining the organizational structure for fifth-grade students? According to the DCO question # 12, the majority, 112 (62.2%) out of 180 fifth-grade general education teachers reported

having had a voice in the school-based decision of determining the organizational structure for fifth-grade students at their respective schools. Eight-eight (37.8%) of the 180 teachers reported having no voice in the school-based decision about the schools' fifth-grade organizational structure as summarized in Table 13.

Table 13

Percentages of Teachers' Voice in the Structure Decisions

Question # 12	As a teacher, did you have a voice in the decision-making process at your school concerning the fifth-grade classroom organizational structure? (Click one)	Response %	# of Responses
	YES	62.2%	112
	NO	37.8%	88
	Most fifth-grade general education teachers had a voice in the school's organizational structure decision for the fifth-grade classroom.	Item #12 Narrative Summary	

Research Question #7

Do teachers believe their initial college training adequately prepared them to teach all core subjects at the fifth-grade level? As shown by Table 14, 89 of the 180 teachers (49.4%) indicated their college training was adequate for teaching all subjects at the fifth-grade level. In contrast, 91 of the 180 (50.6%) fifth-grade teachers indicated

their initial college training was inadequate for teaching all subjects at the fifth-grade level.

Table 14

Teacher Adequacy of Initial College Training

Question # 13	Did your initial college training adequately train you to teach all subjects at the fifth-grade level? (Click one)	Response %	# of Responses
	YES	49.4%	89
	NO	50.6%	91
	Participants were almost equal in their belief concerning their initial college training to adequately teach all subjects at the fifth-grade level.	Item #13 Narrative Summary	

Results Summary

The 2006-2007 and 2007-2008 fifth-grade students' CRCT results presented in this chapter primarily denote there is no significant difference between students taught in the traditional (self-contained, one teacher for all academic subjects) setting and the departmentalized (math taught by a different teacher) setting based on the mean scale scores. However, there was a significant difference between the percentage of students passing with a performance level of two (2) or three (3) in the two organizational structures during 2007 with the departmentalized structure having a higher percentage. In

2008 no significant differences were found between the two groups on the passing percentages with the performance level of two (2) or three (3).

The Data Collection and Opinions for Teachers findings indicated the departmentalized structure as the preferred choice of teachers for fifth-grade students; the majority of teachers reported having a voice in the structure decision for the fifth grade; and, teachers were divided in believing whether their initial college training prepared them to teach all subjects at the fifth grade level. In the experience categories of the DCO, veteran teachers with more than 15 years teaching experience represented the highest number of respondents (31%). Fifty-two percent of the responding teachers indicated less than five years teaching experience at the fifth-grade level (See Questions #2, #3, and #4 of Table 11). Certification levels and fields of responding teachers revealed 74% completed advanced degrees; 94% received an early childhood certificate for pre-school through fifth grade; and, several teachers reported certification in other areas. More than half of the 180 teachers earned an additional certificate endorsement in various areas while only 15 teachers have a certificated endorsement in mathematics. Sixty-nine percent of the responding teachers have not received any specific college-level training in math since obtaining their undergraduate degree yet fifty-five percent reported specific math pedagogical training. Math was ranked as the most enjoyed subject taught; reading was selected as the most qualified to teach; and, science and social studies were the subjects ranked as least enjoyed as well as least qualified to teach. Responding fifth-grade teachers, 89.4 %, believed a teacher with specialized training in a specific content area can better serve students in a departmentalized setting. A more detailed description and discussion of the DCO findings are presented in chapter five.

CHAPTER FIVE: SUMMARY AND DISCUSSION

The purpose of this final chapter is to briefly summarize the research study presented in the previous chapters and discuss the results. The chapter is divided into the following specific sections: (a) the purpose of the study with the restatement of the problem; (b) review of the methodology; (c) summary of the CRCT and DCO results; (d) discussion of the results which includes the relationship of the findings with research connections, additional DCO findings with teacher comments; (e) implications; (f) limitations; and, (g) suggested recommendations for further research as it relates to the classroom organizational structure for upper-elementary students

Purpose of the Study

The elementary classroom structure with relevance to student achievement is just as unresolved today as it was decades ago.

> The controversy as to which serves children better—the self-contained or departmentalized organization—is not likely to be settled by the evidence reported in one study; nor can it be assumed that what is true in one elementary school is true in another (Lamme, 1976, p. 218).

Diverse structured arrangements are often debated and discussed. These controversies involve differing opinions from the individual school-level teachers, administrators, and parents to the district-wide and state-level curriculum personnel. Stakeholders involved in these deliberations have individual views and opinions concerning the best type of organization for instruction in core subject areas at the elementary level (Ackerlund,

1959; Canady & Rettig, 2008; Catledge-Howard, Ward, & Dilworth, 2003; Lamme, 1976; Livingston, 1961; McGrath & Rust, 2002).

With the 2007 reauthorization of the *No Child Left Behind Act*, educators are further required to improve the academic achievement of every student (U.S. Department of Education, No Child Left Behind: Building on Results, 2007). These demands align with the United States Department of Education concerning the need for greater emphasis on the mathematical achievement of students. "America's schools are not producing the math excellence required for global leadership and homeland security in the 21st century" (The facts about math achievement, 2006, ¶1). With the challenge to maintain the NCLB goals and focus on the mathematical concerns, the best teaching structure to produce the greatest level of student achievement was addressed in this research study.

Student achievement research findings were inconsistent with results favoring both the traditional and departmentalized classroom organizations. In studies by Garcia (2007) and Moore (2008), not only were the student achievement findings addressed, but the necessity of teachers' opinions being respected when making the school-level organizational decision was considered an important facet of improving the academic achievement of students.

Restatement of the Problem

The predominant problem identified in this study was to determine the best organizational structure—traditional or departmentalized—to produce the greatest improvement in fifth-grade general students' mathematics achievement scores as measured by the Georgia CRCT. A secondary related issue addressed the role of teachers' experiences, perceptions, and opinions regarding the organizational decision.

Review of the Methodology

All fifth-grade students within the state of Georgia are administered the CRCT every spring. The research sample of 9,386 general education fifth-grade students was based upon the 57 elementary schools within a regional educational service agency district located in northeast Georgia during two school years. Students were identified as having been organized in the traditional (self-contained, one teacher for all academic subjects) or departmentalized (math taught by a different teacher) setting during 2006-2007 and 2007-2008. The archived CRCT data was divided into two specific levels, students taught in a traditional (self-contained, one teacher for all academic subjects) classroom or students taught in a departmentalized (math by a different teacher) classroom. All students identified with special needs were excluded from the study.

Using the fifth-grade CRCT math scores, *z* scores were used to compare the students' passing percentages with a performance level of two (2) or three (3). A two-sample *t test* was used to determine significant differences between the mean scale scores. The differences compared the traditional classroom of students with the departmentalized students. All statistical analyses were performed using the Statistical Package for the Social Sciences software. The study describes the mean and standard deviation using an alpha level of .05 for statistical significance on *t* tests and .005 for *z* scores. These results addressed *Research Questions* #1, #2, #3, and #4.

To address teacher perceptions and opinions concerning the organizational structure of the classroom, an anonymous, electronic teacher Data Collection and Opinion for Teachers was administered to all fifth-grade general education teachers within the 57 participating schools. Findings from the Data Collection and Opinions for

Teachers results were compiled, summarized, and presented in Tables 11-14 by reporting the total percentages of item responses and to address *Research Question*s #5, #6, and #7.

Summary of the Research Results

Georgia CRCT

Research Questions #1 and *#3* addressed whether a difference existed between the general education fifth-grade students in a traditional (self-contained, one teacher) or departmentalized (math taught by a different teacher) classroom as having a higher percentage of students passing the minimum state expectations with a performance level of two (2) or three (3) on the Georgia mathematics 2007 and 2008 CRCT. For 2007 *Research Question #1* the *Null Hypothesis 1-*H_{01} was rejected when the *z* score for population proportion was calculated with significant differences using the *p* value at a .005 significance. Findings were: $z = -3.0905$ and $p = .002$. There was evidence for a difference in the proportion of students who passed the state minimum expectations in the two studied groups of traditional (self-contained, one teacher) and the departmentalized (math taught by a different teacher) students during 2007. However, *Null Hypothesis 2-*H_{02}, which addressed the groups in 2008, was retained when no significant difference was noted ($z = .2019$ and $p = .84$).

Research Questions #2 and *#4* addressed whether a difference existed between the general education fifth-grade students in a traditional or in a departmentalized classroom as having a higher mean scale score on the Georgia mathematics CRCT for 2007 and 2008. For both of the research questions in 2007 and 2008, the *Null Hypotheses 3-*H_{03} and *4-* H_{04} were retained when the mean scale scores noted no significant differences on the *t*-

test using the *p* value at the .05 significance. (2007: ($t(4649) = -.32$, $p = .749$); 2008: ($t(4737) = .4989$, $p = .6179$).

Data Collection and Opinion for Teachers

Research Question # 5 considered which organizational structure for the instruction of fifth-grade students was preferred by fifth-grade teachers. According to the DCO question #11, 75.6% general education fifth-grade teachers preferred the departmentalized classroom organization for fifth- grade students. These results coincide with Moore's (2008) study. Only 44 teachers, 24.4%, preferred the traditional (self-contained, one teacher for all academic subjects) structure. Additionally, 5% of the participating teachers also suggested other options.

Research Question # 6 focused on teachers' voice in the school-based decision of determining the organizational structure for fifth-grade students. According to the DCO question #12, the majority of fifth-grade general education teachers, 62.2%, reported having had a voice in the school-based decision of determining the organizational structure for fifth-grade students at their respective schools. The remaining 88 responding teachers, 37.8%, reported having no voice in the school-based decision about the schools' fifth-grade organizational structure.

Research Question #7 considered teachers' opinions regarding the belief of their initial college trainings' adequacy to prepare them to teach all core subjects at the fifth-grade level. Responses on the DCO question #13 were almost equal in regard to the adequacy or inadequacy of the initial college training preparation. Eighty-nine responding teachers, 49.4%, indicated their college training was adequate while 91

teachers, 50.6%, responded their training was inadequate in preparation to teach all core academic subjects at the fifth-grade level.

Discussion of the Results

Relationship of the Current Study to Prior Research

No prior research studies were found comparing the percentage of students passing with the minimum state expectation for the two organizational structures, traditional (self-contained, one teacher) or departmentalized (math taught by a different teacher). This data analysis was an important criteria indicator because it is used by the Georgia Department of Education as the measurement statistic for annual yearly progress (AYP), an evaluative component of NCLB. Also, very few previous research studies were completed studying students' achievement scores in only mathematics with the two organizational structures, traditional or departmentalized. Other variables were often considered.

Previously reviewed historical and modern-day studies were inconsistent in determining which organizational structure, traditional (self-contained, one teacher) or departmentalized (math taught by a different teacher), was best suited for fifth-grade students. Findings from this study would add to Garrigan's (1992) earlier reported research studies concluding no significant differences between the students' academic achievement on various subject areas and based on the mean scale scores and two classroom structures. Additionally, this study aligns with the reported findings of Morrison (1968), Harris (1990), and McGrath and Rust (2002) that no significant differences were noted in students' mean scale scores in mathematics.

Since no significant differences were found in the mean scales scores of students in the current study, these findings strongly disagree with Littlejohn's (2002). Littlejohn's results showed the traditional, self-contained students had significantly outscored the team taught students in math. The present study had no findings in favor of the traditional, self-contained setting in 2007 or 2008 related to student achievement scores in math.

Moore's (2008) findings using the mean scale scores in math were statistically significant favoring the departmentalized structure. Such was not the case with mean scale scores in the present study with the 2007 or 2008 data. However, the departmentalized group had a significant difference over the traditional setting with the percentage of students passing and exceeding the CRCT expectations in 2007. The difference was not evident in 2008.

A distinct aspect of Moore's (2008) study revealed a departmentalized structure was preferred by fourth and fifth-grade teachers over the traditional, self-contained structure. This study of 136 fifth-grade teachers, 75.6%, preferred the departmentalized structure for fifth-grade students. These findings concur with Moore's results of 56% of fourth-grade teachers and 72% of fifth-grade teachers' preferences. These findings further agree with the previous findings of Ackerlund (1959) whereas the teachers in grades three through six also preferred the departmentalized structure.

One final connection to prior research involves teachers. Bowser (1984) concluded teachers were the key factor in impacting students. McPartland (1990) believed the teaching staff in a school provides the foundation for a successful learning environment. Concerning the school-based decision of which organizational structure

should be used Garcia (2007) indicated a semi-departmentalized setting was successful if teachers selected the method of instruction. From the DCO results of the present study, 62.2% (112 of 180) surveyed teachers reported having had a voice in the type of structure used. Perhaps the leadership of teachers in decision-making possibly accounted for the similarities in the students' academic achievement findings in both classroom settings.

Additional Findings from the DCO

Specific findings from Table 11 indicated the overall years of teaching experience by teachers completing the DCO was somewhat balanced. In the experience categories using DCO questions #2 and #3, veteran teachers with 16 or more years of teaching experience comprised the highest percentage of teachers, 31.1%, while teachers with 11-15 years of teaching experience had the smallest percentage, 19.4%. In regards to teaching experience at the fifth grade level, a majority of the responding teachers, 52.2%, had less than five years. The remaining teachers' responses included 29.4% with 5 to 10 years, 9.4% with 11-15 years, and 8.9% with 16 or more years teaching experience at the fifth grade level

In the areas of certification, approximately three-fourths, 74.4%, of the reporting teachers earned an advanced degree beyond the initial certification. Other certifications included three teachers with National Board Certification and two teachers who were also certified in a Leadership area. Most surveyed teachers, 93.9%, were certified in Early Childhood (P-5) while the next highest certification fields (27.8%) were in Middle Grades Language Arts and Social Studies. Some teachers signified certification in multiple fields thus accounting for multiple responses. In the "other" area of question #5, 37 teachers reported additional certifications. These areas included not only leadership

certifications, but 12 teachers with Special Education certification. Other areas included Physical Education, French, Music, Spanish, and Secondary Social Studies.

The majority of the DCO responding teachers, 51.1%, reported no specific certified endorsements. Several teachers, however, noted endorsements. Of these earned endorsements, most were in reading with 18.9% of the responding 180 teachers while some teachers reported endorsements in other areas. Only 15 of the 180 responding teachers, 8.3%, reported earning an Early Childhood Math Endorsement (See Table 11, Question #6).

Responses to Question #7 of the DCO revealed 56 of the 180 responding teachers (31.1%) received approximately three to four college-level courses in math beyond the undergraduate degree. Question #8 revealed more than half of the teachers, 55%, had training in math pedagogical strategies and skills beyond the undergraduate degree with reported numbers of classes ranging between one to six classes. It seems this might impact the students' academic achievement in math. These findings agree with Anderson (1962) who felt the need for specialized teachers. "Some teachers who have mastered an area of knowledge may be able to lead their pupils to a comprehension of the basic ideas of the discipline" (p. 254).

It is evident through the DCO findings fifth-grade teachers most enjoy teaching math (39.4%) and reading/language arts (31.7%) rather than science and social studies. Also, the subjects teachers indicated most qualified to teach are again in the areas of reading/language arts (41.5%) and math (38.9%) (See Table 11, Questions #9 and #10).

When teachers were asked if they believed teachers who have specialized training in a specific subject area can better serve students through some type of

departmentalization at the fifth grade, the majority of teachers, 89.4%, responded with yes. This aligns with teachers' preference for a departmentalized setting over a traditional setting for fifth-grade students.

The final DCO question #15 allowed teachers the opportunity to describe their present teaching structure or add any additional comments. Sixty-one of the 180 teachers, 34%, expressed their thoughts. These thoughts are further explained in the next section.

Unanticipated Findings with Teachers' Comments

As the data collection portion of this research study began, the researcher became inundated with questions from district-level personnel to school-level personnel including principals and teachers. Many expressed some of the same concerns previously anticipated by the researcher. Everyone wanted to know the results. It became more evident that this topic was of extreme importance to educators within the RESA district even though it was also controversial.

Because of teachers' involvement in the routine interaction with students and administrators, it is imperative to note the comments of the participants in the last question of the DCO. It is impossible to use all 61 responses, but examples below will describe and generalize the thoughts of the fifth-grade teachers. Of the total comments, only 10% (6 of 61) responded in favor of the traditional structure while the remaining 90% (55 of 61) of comments strongly favored the departmentalized structure possibly indicating a formidable appeal to teach in a departmentalized setting. To prevent bias, an equal number of comments taken from DCO Question #15 are presented for each structure. It should be noted the teacher comments were sometimes shortened due to the repetitive nature of the comment.

Traditional (self-contained, one teacher for all academic subjects)

- I feel that fifth graders are not developmentally ready to switch classes and need to remain in a self-contained classroom for maximum academic and emotional growth and development.
- I have taught in both types of structure and I believe that teachers and students benefit from the traditional structure. I think there is too much time lost in transition when there is departmentalization. . . . I think the benefits of having the same kids all day long far outweigh my desire for ease of planning!
- I feel that fifth-grade teachers should remain being trained as "specialists" in all core areas because many 5th-grade students still struggle with reading, writing, and math. All of these are addressed in any area of teaching. We, as teachers, need the strategies to help these struggling students.
- Currently we use ability grouping and we teach all subjects. . . . Since true departmentalization requires a high degree of commonality in our approach to discipline. . . I don't believe that form of organization would be beneficial for our school at this time.
- I have departmentalized and switched with three other teachers. I did not like that much as communication becomes harder and teaching the same lesson four times a day became mundane.
- This year we opted for a traditional setting due to having only three teachers in fifth grade. Due to scheduling conflicts, exchanging classes was too time-consuming. Additionally, with the use of guided reading, having one teacher responsible for reading groups for 75 students is an unrealistic task.

Departmentalized (math taught by a different teacher)

- The traditional classroom works well for the lower grades, but the content load with the new GPS is so much greater at fifth grade and the social needs of the kids are so different that I do not support being self-contained at fifth grade.
- We enjoy departmentalized in the 5th grade because that are getting ready to go to middle school. We are preparing them to go to the middle school and they do not need to be self-contained. Also, we are more specialized in teaching our subject area. Some of us just enjoy teaching LA and Reading when the others enjoy teaching Math, Science and etc. I truly believe that you should teach what you are better at in teaching and what you enjoy and you will do a better job in everyday.
- I am currently teaching all subjects to my fifth-grade classes. I believe that this is the most ineffective method of teaching students at the elementary level. In essence, I am a “Jack of all trades, master of none.”. . . My colleague and I were made to go to a "self-contained" structure shortly after the year began. . . . Not everyone spends the same amount of time and effort on their lesson plans. Students in this type of teaching structure end up being short changed!
- With the increased GPS rigor expected of fifth-grade students and with the middle school structure consisting of change, it is beneficial and expedient to not only train the fifth-grade students to move classes, but also to provide in-depth instruction in each core subject. Departmentalizing the fifth grade allows teachers time to prepare so they can teach in-depth lessons. All teachers must communicate much more closely and work together to provide a comprehensive framework for each student and his/her progress.

- I truly believe that you should teach what you are better at in teaching, what you enjoy, and then you will do a better job in teaching every day. I like having only three preps because I feel I can devote more time and concentrate on what the students need to learn. I think the students benefit when the teacher teaches his/her strengths and passion.
- I believe that being a successful teacher is proportional to the comfort level a teacher has in teaching a subject. Our team has been successful with departmentalization, because we work together. We use our strengths to decide what we teach, along with data driven instruction. It takes a lot of planning and collaboration for it to be successful. I have enjoyed getting to know all the students.

Implications

With over 30 years in education, the researcher has had the opportunity to teach 27 years in fifth and sixth grades in both traditional and departmentalized structures in two different schools. The most recent four years have been spent working with and consulting elementary and middle-grades teachers, specifically in the area of math. Too often the phrase, “research says. . . ” has been used by administrators and school-level personnel to describe the better organizational structure and justify which structure is best to use for fifth-grade students—the traditional or departmentalized—and what other variables might impact this decision?

The research review indicated discrepancies. The variables were never consistent among the studies and the instruments used to collect data were irregular. In order to add to the research base, the current study primarily analyzed two years of student

achievement data for more than 9,000 fifth-grade students and surveyed responses from 180 general education fifth-grade teachers.

Based on the findings of the current study several implications can be drawn. The CRCT math results for fifth-grade general education students revealed a statistically significant difference favoring the departmentalized structure over the traditional setting with the percentage of students passing in 2007. Results of the Data Collection and Opinion for Teachers survey revealed the departmentalized setting was the preferred organizational structure with 76% of respondents and 62% of teachers had a voice in the decision concerning the organizational structure at their school These findings indicate that in order to achieve maximum student achievement results, fifth-grade general education classrooms should be arranged in a departmentalized setting. Because the participating teachers prefer the departmentalized setting this research study further indicates the continued need for teachers to be involved in the school-based decision regarding the organizational structure for fifth-grade students. Other implications are evident and need to be considered before final organizational structure decisions are made.

First, not only do administrators need to continue to involve teachers in the decision-making process about the organizational structure, but the credentials of a teacher should be examined before assignment to a specific structure. The DCO results indicated teachers were divided (49.4% yes and 50.6 % no) in the belief that their initial college training prepared them to teach all core academic subjects at the fifth-grade level. Several teachers had advanced degrees, were certified in multiple areas, and had received certificated endorsements in various fields. In spite of this, only a small number were

math endorsed or had received specific math training. A teacher's preference may not always be in the area of strength or comfort level in a specific subject or structure. Through discussions of credentials and interactions among administrators and teachers, the best organizational structure for fifth-grade students must be a joint decision.

A second factor to be considered from this study was learned through the DCO teacher comments. Multiple references to the new, more rigorous GPS curriculum may indicate why the percentage of students passing with a performance level of two (2) or three (3) on the 2007 CRCT was significant on the previously tested QCC curriculum. In an effort to meet the demands of NCLB, perhaps departmentalized teachers used various strategies in teaching math as comments expressed the ability to integrate curricular concepts and maximize learning, provide more in-depth lessons, communicate, and work together with teachers to provide a foundation for students' progress. More students were able to move from the 'did not meet' category—performance level one (1)—to the 'meets' category, performance level two (2) while the students in the 'meets' category—performance level two (2)—advanced to the 'exceeds' category of performance level three (3). In 2008 when students were tested on the GPS, there were no significant differences in the percentage of students passing, or in the mean scale score differences for both structures. Therefore, all teachers in both structures appear to be unfamiliar and less confident with the new Georgia Performance Standards-based curriculum. Teachers should to be provided with professional learning opportunities to increase content and pedagogical skills to address the new curriculum.

Many opinions exist concerning what is best for all students. Through this study, it has become evident that in addition to an organizational structure, other factors must be

considered. It is this researcher's opinion that it is of extreme importance for all administrators to involve teachers in the school-based organizational structure decision for what is the most excellent way to achieve academic success for students. With 63% of teachers having an input into the school-based decision of the organizational structure, it is assumed that oftentimes the decision is made without teacher input. This may account for some teacher dissatisfaction about their school's organizational structure. Comments indicated the new GPS curriculum is not only challenging for students, but for teachers as well. The few comments by the traditional teachers were consistent with the research information concerning the emotional needs of the students. The dissimilarity of the comments by the departmentalized teachers articulated the passion felt by these teachers. Having fewer subject preparations for the new GPS curriculum, feeling comfortable with a subject, and recognizing fifth-grade students' preparedness for middle school, causes the departmentalized teacher to believe the departmentalized setting is the best option for everyone. With the majority of teachers (76%) preferring the departmentalized setting for fifth-grade students and 89% of teachers believing teachers with specialized training could better serve students in a departmentalized setting, it becomes evident that teachers need to be consulted when making the organizational decision for students.

It is crucial to remember that in education, the impression on students will influence future generations which coincides with Bowser's (1984) study that teachers make a difference. In one specific chapter, "You Are the Most Important Leader in Your Organization," in *A Leader's Legacy*, by Kouzes and Posner (2006), encouraging words remind all teachers and administrators they do make a difference.

> There is a 100 percent chance that you can be a role model for leadership. There is a 100 percent chance that you can influence someone else's performance. There is a 100 percent chance that you can affect what someone else thinks, says, and does. There is a 100 percent chance that you will make a difference in other people's lives. . . . To realize that we make a difference is both a joyous opportunity and a potential burden. Because we most influence those who are the closest to us, we're given a great gift. (pp. 36-38)

Limitations

One limitation of the study was that the focus and generalized findings were only on the mathematics area of the CRCT for general education fifth-grade students. Other academic core subjects reading/ language arts, science, and social studies, were not considered for dependent variables. Several schools within the RESA district use a departmentalized option for other subject areas rather than math. Therefore, findings may have differed with the other academic areas.

A second limitation is that the sample only used fifth-grade student data. Throughout the state of Georgia, a variety of departmentalization organizations is used at other elementary grade levels. The results from this study may not be applicable to other grade levels.

A third limitation involved the departmentalized (math taught by a different teacher) option used within the schools. There were inconsistencies among the specific types of departmentalized options. Some teachers were involved in a two-teacher team situation, three-teacher team situation, and even other arrangements.

A fourth limitation may involve the implementation of a newly developed curriculum. The 2007 student data measured general education, fifth-grade mathematics achievement based on the well-established QCC while the 2008 student data measured general education, fifth-grade mathematics achievement based on the new GPS. Student achievement for both curricula was measured using a valid and reliable instrument (CRCT), and there should be no curricular effect. However, since the curriculum is still under study and scrutiny, there may be some unidentified, extraneous effect(s).

Recommendations for Further Research

Based upon this and previous research, inconsistencies and disagreements still exist regarding the best type of organizational structure for fifth-grade students and teachers. Additional research is recommended in the following areas:

1. An evaluative study to investigate the differences between the CRCT data based on the previous Georgia Quality Core Curriculum and the newly established Georgia Performance Standards in mathematics.
2. A longitudinal study of three or more years to examine the difference between the traditional and departmentalized settings CRCT math scores based on the new Georgia Performance Standards.
3. A study which compares students' math achievement scores between teachers with math endorsements/strong math backgrounds with a generalized elementary teacher without the specialized training using differentiated instruction strategies.
4. A study to examine the relationship between *traditional* and *departmentalized* classroom instruction in other content areas besides mathematics.

5. A replication study to examine the impact between *traditional* and *departmentalized* classroom instruction at other grade levels.
6. An expanded DCO survey to gain insight into the correlation between the teacher's specific structure and how it impacts students' academic achievement.
7. A teacher and student survey to gain information into the impact of the teacher-student relationship and the impact upon academic achievement.

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APPENDIX A

Data Collection and Opinions (DCO) for Teachers

The following is a WORD document version of the anonymous, electronic survey designed through www.surveymonkey.com and accessed by teachers through a specified link.

Data Collection and Opinions for Teachers

1. Data Collection & Opinions of Teachers

Dear Teachers,

As part of the requirements to complete the Doctor of Education (EdD) at Liberty University in Lynchburg, Virginia, I am completing the dissertation component of my degree program. Your participation in this study is requested. Thanks in advance for your responses. Please complete by January 30, 2009.

Sincerely,

Marcia W. Williams

2. Important Information

Confidentiality Statement:

All records of this study will be kept secure and private. None of the information obtained from this study will be used in any publication or report so that a specific individual, school, or system is identified. Research records will be securely stored and only the researcher will have access to the records. System and school officials will not be able to obtain any individual responses.

Voluntary Participation:

Participation in this study is voluntary. Your decision whether or not to participate will not affect your current or future relations with Liberty University, your school system, or the researcher.

Contacts and Questions:

The researcher conducting this study is Marcia W. Williams. If at any time you have questions or problems regarding this study, you are encouraged to contact her at xxxxxxx RESA at xxx-xxx-xxxx;; or email-mwilliams@xxxxxxxxxxresa.org.

If you have questions or concerns about your rights as a research participant and need to talk with someone other than the researcher, you may contact the Human Subject Office, 1971 University Blvd, Suite 2400, Lynchburg, VA 24502 or email fgarzon@liberty.edu.

3. Purpose of Study

This study involves the impact of traditional (one-teacher) and departmentalization (more than one teacher for core subjects) on the mathematics achievement of fifth-grade students as measured by the 2008 Georgia Criterion-Referenced Competency Test. As an added component, the purpose of this survey is to determine the fifth-grade teachers' experiences and opinions about

the organizational structure at this specific grade. Please read the following descriptions before proceeding.

Traditional – (One teacher) – Traditional refers to the elementary structure where one teacher is responsible for teaching all the required core subjects (*Language Arts/ Reading, Mathematics, Science, and Social Studies*) to one group of students for the complete academic year. This structure is often called a self-contained classroom.

Departmentalization - (Core subjects taught by different teachers) – Departmentalization is an organizational structure where two or more teachers share the responsibility of teaching the core subjects (*Language Arts/ Reading, Mathematics, Science, and Social Studies*) for all general students (not special education) during separate time blocks. General education students change classrooms or teachers change classrooms during the school day for core subject instruction by different teachers. Any structure that varies from a self-contained setting is considered a departmentalized option.

1. ____Click here to indicate you have read the above information explaining your voluntary participation and confidentiality rights.
2. How many years of teaching experience do you have? (Click one)

   ____LESS THAN 5 YEARS

   ____5 - 10 YEARS

   ____11 - 15 YEARS

   ____16+ YEARS
3. How many years have you taught fifth grade? (Click one)

   ____LESS THAN 5 YEARS

   ____5 - 10 YEARS

   ____11 - 15 YEARS

   ____16+ YEARS
4. What is your teaching certificate level? (Click one)

   ____T-4 or PBT – 4

   ____T-5 or PBT – 5

   ____T-6 or PBT – 6

   ____T-7 or PBT – 7

   ____OTHER (please list) _____
5. What is your certification field? (Click all that apply)

   ____EARLY CHILDHOOD (P-5)

   ____MIDDLE GRADES (4-8) – LANGUAGE ARTS

____MIDDLE GRADES (4-8) – READING

____MIDDLE GRADES (4-8) – MATH

____MIDDLE GRADES (4-8) – SCIENCE

____MIDDLE GRADES (4-8) – SOCIAL STUDIES

____OTHER (please specify)

6. Do you have any of the following endorsements? (Click all that apply)

____EARLY CHILDHOOD MATH

____GIFTED

____EARLY CHILDHOOD READING

____ESOL

____TSS (TEACHER SUPPORT SPECIALIST)

7. Have you had any specific college-level training in the area of math? (Click one)

____YES

____ NO

If YES approximately **how many** college-level content courses? _____

8. Have you had any specific workshops or pedagogical (strategies and/or skills) training in the area of math? (Click one)

____YES

____ NO

If YES approximately **how many** workshops or training classes in pedagogical, math strategies? _____

9. Rank the core subject areas from **(1)** the one you **MOST ENJOY** teaching to **(4)** the one you **LEAST ENJOY** teaching.

_____ READING /LANGUAGE ARTS

_____MATHEMATICS

_____SCIENCE

_____SOCIAL STUDIES

10. Rank the core subject areas from **(1)** the one you feel **MOST QUALIFIED** to teach to **(4)** the one you feel **LEAST QUALIFIED** to teach.

_____ READING /LANGUAGE ARTS

_____MATHEMATICS

_____SCIENCE

_____SOCIAL STUDIES

11. What is your preference for the classroom organizational structure for fifth-grade students? (Click one)

_____TRADITIONAL (one teacher who teaches all core subjects to a group of students for an entire school year)

_____DEPARTMENTALIZATION (more than one teacher for core subjects where students change classes among teachers)

12. As a teacher, did you have a voice in the decision-making process at your school concerning the fifth-grade classroom organizational structure? (Click one)

____YES

____NO

13. Did your initial college training adequately train you to teach all subjects at the fifth- grade level? (Click one)

____YES

____NO

14. Do you believe teachers who have specialized training in a specific subject area can better serve students through some type of departmentalization at the 5^{th} grade? (Click one)

____YES

____NO

15. If you would like to describe your present teaching structure or any additional comments, please use the box below.

APPENDIX B

Permission Request to RESA Director and Board of Control

XXXX Hwy XXX X
XXXXXX, GA XXXXX
December 10, 2008

Dear Dr. XXXX and Board of Control:

I am currently a doctoral candidate in Educational Leadership – Teaching and Learning at Liberty University in Lynchburg, Virginia. The purpose and overall goal of my dissertation is to determine the impact of *traditional* (self-contained, one teacher) instruction and *departmentalized* (math taught by a different teacher) instruction on the mathematics achievement of regular fifth grade students as measured by the Georgia Criterion-Referenced Competency Test (CRCT).

I propose to use the 2007 and 2008 CRCT mathematics scores of fifth grade general education students from as many different elementary schools as possible within the XXXX RESA district. I respectfully request your permission to use the system data and contact the principal in each of the 59 elementary schools to request a fifth-grade contact person. I further request permission to anonymously survey the fifth-grade teachers to address the teacher factors which might influence the outcome of this research study.

With your permission, I will contact principals for their participation consent and a fifth-grade contact person to determine the approximate number of schools, teachers, and students to include in my research study. Your permission and support are crucial to this study and will be greatly appreciated. At your request, I will share the results with you and your school personnel at the conclusion of the research study.

Thank you for your consideration. If you have any questions, please feel free to contact me at (xxx) xxx-xxxx Ext. xxx; (xxx) xxx-xxxx; or by email at mwilliams@xxxxxxresa.org.

Sincerely,

Marcia W. Williams

APPENDIX C

Institutional Review Board (IRB) Approval

LIBERTY
UNIVERSITY™

The Graduate School at Liberty University

IRB Approval 655.010109: Marcia Williams

Comparison of Fifth Grade Students' Mathematics Achievement As Evidenced by Georgia's Criterion Referenced Competency Test: Traditional And Departmentalized Settings

Dear Marcia,

We are pleased to inform you that your above study has been approved by the Liberty IRB. This approval is extended to you for one year. If data collection proceeds past one year, or if you make changes in the methodology as it pertains to human subjects, you must resubmit the study to the IRB. See the IRB website for appropriate forms in these cases.

Thank you for your cooperation with the IRB and we wish you well with your research project.

Sincerely,

Fernando Garzon, Psy.D.
IRB Chair, Liberty University
Center for Counseling and Family Studies
Liberty University
1971 University Boulevard
Lynchburg, VA 24502-2269
(434) 592-4054
Fax: (434) 522-0477

APPENDIX D

Permission Letter from RESA Director and Board of Control

[redacted] RESA
REGIONAL EDUCATIONAL SERVICE AGENCY

December 17, 2008

Dear Marcia,

This is to inform you as the Director of [redacted] RESA, the Board of Control and I have granted permission for you to use the fifth-grade 2007 and 2008 CRCT math data from all 13 systems for your research study. In addition, you have the superintendents' permission to contact each elementary principal to request participation of each specific school and seek consent to anonymously survey the fifth-grade teachers at the individual school level.

We wish you success as you seek to find additional ways to improve students' academic achievement within the [redacted] RESA district. Please share your results with superintendents, administrators, and individual schools upon their request.

Sincerely,

[redacted]

Dr. [redacted]

[redacted] RESA Director

APPENDIX E

Principal Consent Form

Principal Consent

12-17-08

Dear Principal,

Your superintendent and the XXXX County School System have given permission for me to contact you. As part of the requirements to obtain my Doctor of Education at Liberty University in Lynchburg, Virginia, I am completing the dissertation component of my degree program.

Your participation in this study is requested by submitting an email address of a fifth-grade teacher (perhaps the grade chair) to serve as the contact person. Their only responsibility will be to: 1) verify the type of organizational structure used at your school for the 2006-2007 and 2007-2008 school years; 2) provide the number of fifth-grade general education teachers at your school; and, 3) forward a survey link to other fifth-grade general education teachers within your school.

Please verify the following contact's email address with your initials _____:

XXXXXXX Elementary School	xxxxx.xxxxx@xxxxx.org

Sincerely,

Marcia W. Williams

Purpose of Study: This study involves the impact of traditional (one-teacher) and departmentalization (more than one teacher) instruction on the mathematics achievement of fifth-grade students as measured by the 2008 Georgia Criterion-Referenced Competency Test. As an added component, there is an interest in determining fifth-grade teachers' experiences and opinions about the organizational structure of this specific grade. This component will be measured by an anonymous, electronic data collection tool.

Confidentiality Statement: All records of this study will be kept secure and private. None of the information obtained from this study will be used in any publication or report so that a specific school or system is identified. Research records will be securely stored and only the researcher will have access to the records. *(i.e. System/school officials will not be able to obtain any individual responses.)*

Voluntary Participation: Participation in this study is voluntary. Your decision whether or not to participate will not affect your current or future relations with Liberty University, your school system, or the researcher.

Contacts and Questions: The researcher conducting this study is Marcia W. Williams. If at any time you have questions or problems regarding this study, you are encouraged to contact her at XXXX RESA at xxx-xxx-xxxx; or email-mwilliams@xxxxxxresa.org. If you have questions or concerns about your rights as a research participant and need to talk with someone other than the researcher, you may contact the Human Subject Office, 1971 University Blvd, Suite 2400, Lynchburg, VA 24502 or email xxxxxxx@liberty.edu.

APPENDIX F

Emails to Fifth-Grade Contact Persons

Original Email

Dear_____ (Teacher's Name),

I am a doctoral candidate @ Liberty University. My dissertation topic is comparing the fifth-grade classroom structure of either the *traditional* (self-contained, one teacher teaching all subjects to a group of students) with a *departmentalized* (more than one teacher for core subjects) setting. I will be using the 2007 & 2008 CRCT math scores and a teacher data collection and opinions instrument.

Permission has been granted by your superintendent to involve the XXXXX County elementary schools. Your principal has given me your name as a fifth-grade contact person for XXXXX Elementary School.

As a contact person, I would need to know the answers to the following 3 questions:

1 – Which type of structure (traditional or departmentalized) was used by the fifth grade during the 2006-2007 school year?

2 – Which type of structure (traditional or departmentalized) was used by the fifth grade during the 2007-2008 school year?

3 – How many general education fifth-grade teachers are in your school this year?

Once my study is approved by the IRB at Liberty University, I would like to send an electronic link to an anonymous data collection and opinions instrument. This instrument will include 15 questions to obtain general information and opinions from the general fifth-grade teachers at your school. I would ask for you to respond to the questions and forward the link to all the other fifth-grade general education teachers in your school for their input. All responses will be kept secure and private. Research records will be securely stored and only the researcher will have access to the records. *(i.e. System and school officials will not be able to obtain any individual responses.)*

Will you be willing to serve as this contact person for me at your school? Please let me know as soon as possible.

Thank you for your consideration,
Marcia Williams

Follow-up Email #1

Dear xxxxx,

Thank you for your willingness to serve as the fifth-grade contact person. Please read the definitions below and answer the following questions:

Traditional – (One teacher) – Traditional refers to the elementary structure where one teacher is responsible for teaching all the required core subjects (*Language Arts/ Reading, Mathematics, Science, and Social Studies*) to one group of students for the complete academic year. This structure is often called a self-contained classroom.

Departmentalization - (Core subjects taught by different teachers) – Departmentalization is an organizational structure where two or more teachers share the responsibility of teaching the core subjects (*Language Arts/ Reading, Mathematics, Science, and Social Studies*) for all general students (not special education) during separate time blocks. General education students change classrooms or teachers change classrooms during the school day for core subject instruction by different teachers. Any structure that varies from a self-contained setting is considered a departmentalized option.

1 – Which type of structure (traditional or departmentalized) was used by the fifth grade during the 2006-2007 school year?

2 – Which type of structure (traditional or departmentalized) was used by the fifth grade during the 2007-2008 school year?

3 – How many general education fifth-grade teachers are in your school?

Follow-Up Email #2

xxxxxx,

PLEASE USE THE LINK BELOW TO COMPLETE THE SURVEY. THEN, DELETE EVERYTHING ABOVE THE DOTTED LINE AND FORWARD THIS EMAIL TO ALL THE OTHER 5TH-GRADE GENERAL EDUCATION TEACHERS AT YOUR SCHOOL.

I would appreciate your help in encouraging each 5th grade teacher to participate. I think the results will be significant for many of our elementary schools in the XXXXX RESA district. Superintendents, principals, and teachers are anxious to learn the results.

Teachers,

Please access this *important* 5th grade TEACHER survey by clicking on the link below or copying and pasting the link into an Internet browser. The survey will close January 30th @ 5:00PM.

IT WILL ONLY TAKE YOU ABOUT 5-MINUTES.

http://tinyurl.com/5thgradesurvey

I sincerely value your input for this 5th-grade research study. It is an anonymous survey. No one, not even me, can identify your individual, school or system responses. All results will be collected as a group.

Thank You,

Marcia Williams

Follow-Up Email # 3

We're almost to 70% of all 5th grade general education teachers in XXXXX RESA!

This is just an email reminder to encourage anyone who has not completed the survey to please do so. It will be available until Friday, January 30th.

Please access the 5th grade survey by clicking on the link below or copying and pasting the link into an Internet browser

http://tinyurl.com/5thgradesurvey

Thanks again for your assistance,

Marcia

APPENDIX G

2006-2007 Fifth-Grade Organizational Structures

School #	06-07 Structure	School #	06-07 Structure
1	*1	30	0
2	0	31	0
3	0	32	1
4	0	33	1
5	1	34	1
6	0	35	0
7	0	36	0
8	1	37	1
9	1	38	0
10	1	39	0
11	0	40	1
12	1	41	0
13	0	42	1
14	0	43	1
15	1	44	1
16	0	45	1
17	0	46	0
18	1	47	0
19	0	48	1
20	0	49	0
21	1	50	0
22	0	51	*0
23	1	52	*1
24	0	53	1
25	1	54	0
26	0	55	1
27	0	56	1
28	1	57	*0
29	0	*	Exceptions

0 – Represents Traditional (self-contained, one teacher for all academic subjects)

1 – Represents Departmentalization (math taught by a different teacher)

APPENDIX H

2007-2008 Fifth-Grade Organizational Structures

School #	07-08 Structure	School #	07-08 Structure
1	*1	30	1
2	0	31	0
3	0	32	1
4	0	33	*1
5	1	34	1
6	0	35	1
7	0	36	0
8	1	37	1
9	*1	38	0
10	1	39	0
11	0	40	1
12	1	41	0
13	0	42	1
14	0	43	1
15	0	44	1
16	0	45	1
17	0	46	0
18	1	47	0
19	0	48	1
20	0	49	0
21	1	50	1
22	0	51	*1
23	1	52	1
24	1	53	1
25	1	54	0
26	1	55	1
27	0	56	1
28	1	57	*0
29	0	*	Exceptions

0 – Represents Traditional (self-contained, one teacher for all academic subjects)

1 – Represents Departmentalization (math taught by a different teacher)