

Elementary Classroom Organization Delivery Model and Its Effect  
on Student Achievement

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## **Abstract**

The education spectrum includes many different modes of instruction or organizational models. The following are examples of organizational models available to school leaders: self-contained, departmentalized, team-teaching, collaboration, changing classes, and rotating classes. In this spectrum, the self-contained classroom and the departmentalized classroom are the most frequently used organizational models. The self-contained classroom involves one teacher instructing a group of students in all academic subjects. In contrast, the departmentalized classroom is a setting where educators teach in one area of specialization and students move from one classroom to another for instruction. When considering effective organizational models, it is imperative for administrators to pay attention not only to the quality and content of a lesson but also to the organizational structure in which the instruction is presented. This study included 94 schools using either a self-contained or a departmentalized classroom organization model. The purpose of the study was to identify the organizational model, either departmentalized or self-contained, that had a significant difference in measures of students' academic performance on reading and mathematics VSL pass rates for fourth graders in Region II of Virginia. Analysis of variance (ANOVA) was used to test the hypothesis and results revealed that there is no evidence of a significant difference between the two classroom organizational models on either reading or math VSL test pass rates for fourth graders. The findings suggest that no significant differences in reading and math VSL pass rates existed among schools with the two different classroom organizational models. Controlling for school size and the presence or absence of school Title I status (40% or more of its students come from families who qualify as low income

under U.S. Census definitions) did not have an effect on the comparison related to fourth-grade general education students' pass rates on the 2009–2010 school year reading and math VSL pass rates.

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## **Dedication**

First and foremost, this dissertation is dedicated to the Lord who has given me the strength and wisdom needed to complete this goal. I put my whole life and trust in His hands at all times. In addition, I would like to dedicate this dissertation to my two best friends, Dan Schmit, and my dog, Brandy. The two of them encouraged me when I was down and were always supportive no matter what crisis I was in at the time. Everyone knows I am not a lover of math, but Dan always told me I could do it and I did it. Working full time and going to classes four nights a week, Dan was always there to listen to my complaints and my celebrations in my accomplishments. Thanks, Dan.

Whether late nights or early mornings, my “furry” friend, Brandy, was either beside me wanting to play or just sleeping. Either way she was beside me throughout the entire process. She is now 14 years old and I know part of her is sticking around to make sure I finish. She is the BEST dog anyone could ever hope to own.

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## Chapter 1: Introduction

School leaders have numerous organizational options available to them.

Determining the most effective organizational structure of elementary schools is an issue that has been argued by educational specialists and administrators since the beginning of the 20th century (McGrath & Rust, 2002). The organizational models include the self-contained, departmentalized, team-teaching, collaboration, changing class, and rotating class models. The self-contained and departmentalized classrooms are the most often in the elementary school used organizational models. In a self-contained setting, one teacher instructs a group of students in all subject areas, and the departmental model is a classroom organizational model in which an educator specializing in a particular subject matter teaches groups of students who move from one classroom to another for instruction. Identification of the most effective organizational classroom model requires school administrators not only to consider the quality and content of the lesson but also the manner in which instruction is organized in the classroom. This should not only be a concern of the school administrators but also a concern of students, parents, and policymakers who are stakeholders in the elementary school system.

The first few years of schooling are important to both the aspirations and achievement of all students (Chan & Jarman, 2004). Early exposure of children to school subjects is associated with a child's subsequent academic successes or shortcomings, and schooling in the early years builds the foundation for future success (McGrath & Rust, 2002). One does not learn in isolation; therefore, interactions and relationships with teachers and classmates are associated with each young child's social growth and development (McGrath & Rust, 2002). Learning is truly a lifelong experience that is

influenced by numerous individuals and events (Hill, Rowan, & Ball, 2005). Thus, use of the most effective organizational model possible is critical to students' future success in school.

Enhancing the reading performance of elementary school children is of national interest, and it is the best fit for comparison between the two settings since reading and math is of national interest and affects student performance in other areas such as science and social studies. As indicated by researchers at the National Center for Education Statistics (NCES) in 2004, 4 of 10 fourth-grade students were below the proficiency level in reading.

### **School Environment**

The first few years in the educational career of an individual are said to be crucial, as they are foundational for igniting the individual's love of and commitment to learning in each subject area (McGrath & Rust, 2002). Administrators who plan the curriculum must ensure clear relationships among the various subjects so that education is complete and cohesive. The strength and cohesiveness of these relationships can be assessed in either a self-contained or departmentalized classroom setting. School administrators must analyze situations, decide, and resolve concerns by exploring all possible avenues to address these concerns.

This research study addressed the effects (if any) self-contained and departmentalized classrooms had on fourth-grade students' academic performance in math and reading. Administrators can use the study results to make informed decisions about the type of organizational model that best serves the interest of their school's pursuit of academic excellence. Academic excellence is at the forefront of the mission

and vision of elementary schools not only in the United States but also worldwide, as schools are assessed through standardized tests. The challenge confronting school administrators is how to organize their schools so that they can meet both district-level and national achievement benchmarks.

The following terms are defined to provide clarity of usage in this study:

**Departmentalized classroom.** A departmentalized classroom is an organizational model within which the teacher is permitted to specialize in the teaching of one or a few subjects. This organizational method is one in which the teacher moves from room to room to teach the various classes or the pupils move from room to room for their classes (Good & Phi Delta Kappa, 1973).

**Self-contained classroom.** The self-contained classroom is the unit of organization whereby one teacher conducts all or nearly all the instruction for the class throughout the school day with the exception of art, music, and physical education (Good & Phi Delta Kappa, 1973).

### **Self-Contained Model**

In some elementary schools, the typical educational setting is a single classroom with one teacher responsible for teaching the core subjects of mathematics, language arts (i.e., reading, grammar, mechanics, and writing processes), science, and social studies (Chan & Jarman, 2004). In this model, the teacher is a generalist. Advocates claim that within this model (a) students can become better acquainted with the teacher; (b) the teacher can become aware of each student's strengths, weaknesses, and personality traits; and (c) more flexibility in scheduling, less transition time, and better chances for integration of different content areas are permitted (Catledge-Howard, Ward, Dilworth, &

Mississippi State University, 2003; McGrath & Rust, 2002). Historically, elementary teachers operate in the self-contained model. With the exception of physical education, art, and music, the students are with the same teacher throughout the day.

Although minimal research on the effectiveness of self-contained classrooms exists, the results of the available research have significant implications. McGrath and Rust (2002) found that performance of fifth- and sixth-grade pupils on the Tennessee Comprehensive Assessment Program (TCAP) in the total battery of language and science subtests was significantly higher in self-contained classrooms than in departmentalized classrooms. No differences in math, reading, and social studies subtests were noted in either group (Catledge-Howard et al., 2003; McGrath & Rust, 2002). Alspaugh and Harting (1995) observed that a transition from self-contained to departmentalized settings resulted in significantly lower marks in reading and math pass rates. The assumption is that all traditional, self-contained classroom teachers are subject matter generalists, equally strong in all core academic subject areas. According to Chan and Jarman (2004), however, most teachers are not as interested or as knowledgeable as needed in every subject area.

### **Departmentalized Model**

Departmentalization is an organizational model in which different teachers teach children several subjects (McGrath & Rust, 2002). With the enactment of the No Child Left Behind (NCLB) Act of 2001, greater accountability is required among stakeholders in the nation's school divisions and the need for more highly qualified and competent teachers is evident (Hill et al., 2005).

## **Assessment and Accountability**

What impact do the organizational models of self-contained and departmentalized classrooms have on the academic performance of elementary children? In which organizational model do students perform better? These principle questions were explored in this study.

Assessment of student performance in fourth-grade reading and mathematics was conducted using the Virginia Standards of Learning (VSL) in reading and math at the fourth-grade level. VSL tests are the tools used to assess the learning and achievement levels of students in Virginia's public schools. According to researchers at the Virginia Department of Education (VDOE, 2002), these standards represent the contents of curriculum that many stakeholders in education, such as teachers, school administrators, parents, and business and community leaders, have deemed appropriate for learning in a particular grade level. Through the VSL tests, leaders in the VDOE and in the school divisions can assess the academic performance of elementary school children. These assessments also are the criterion used to determine school accreditation. Former President George W. Bush's No Child Left Behind Act of 2001 (2002) and the reauthorization of the Elementary and Secondary Education Act, which was signed into law on January 8, 2002 (NCLB,2002), had four student achievement areas: (a) English, (b) mathematics, (c) science, and (d) history. Both English and mathematics performance are measured in Grades 3 through 8; science and history VSL assessments are conducted in selected grade levels (i.e., 3, 5, and 8). With the challenge of meeting NCLB goals, administrators and teachers must address the best organizational model to produce the greatest level of student achievement (Stewart, 2008).

## **Background and History**

In 1995, researchers conducted the Third International Mathematics and Science Study (TIMSS), currently known as the Trends in International Mathematics and Science Study, to evaluate the performance of U.S. students in mathematics and science in comparison to other countries' students in two different grade levels. The 1995 TIMSS assessments showed that U.S. fourth graders performed at an average level in both mathematics and science in comparison to students in other nations, but U.S. 12th graders scored below the international average and among the lowest of the TIMSS nations in mathematics and general knowledge science, not passing the international benchmarks in either subject. The U.S. students continued to lag behind other nations on the TIMSS when it was administered in 1999 (U.S. Department of Education, 2000).

## **Historical Background**

The first schools in the United States had schoolhouses with children of all ages occupying one room and one teacher to facilitate instruction. The first school was a grammar school in Boston, Massachusetts, which opened in 1848 (Silberman, 1970). Impressed by the system in Germany, the first American educators adopted a graded system. During its early years, the Quincy School in Boston had 12 equal-sized rooms in which each teacher met with some 55 children for 1 year at a time. The creators of this system predicted that this would be the pattern for the next 50 years; the system existed well beyond their estimate (Silberman, 1970).

Elementary schools were originally organized utilizing a self-contained model (Heathers, 1967). In the early 1900s, departmentalization was recognized as an optional educational organizational model. Mohl (1977) reported that it was William A. Wirt,

then superintendent of schools in Gary, Indiana, who originated the departmentalized model of class organization according to subject area. Wirt's plan became known as the "Platoon School" plan. Under this plan, departmentalization was more extensive than what existed in schools by the latter half of the century (Walters, 1970). In another school division, Denver Public Schools, where departmentalizing is called *platooning*, elementary students as young as age six change classrooms and share teachers who specialize in only one, two, or three subjects (Hood, 2009).

Eccles, Lord, and Midgley (1991) explained that at the elementary level, some school administrators and organizers prefer the departmentalized rather than the self-contained organizational model, because it allows students to become familiar with and more easily adjusted to the secondary educational system. Students previously exposed to departmentalization during the latter part of their elementary education would not spend as much time becoming acclimated to the secondary school organization.

Between 1910 and 1920, interest in the departmentalized setting increased. The second decade of the 20th century had included transition, unrest, and reformation in all aspects of American life, and these became the catalysts for departmentalizing public schools (Silberman, 1970). Silberman (1970) postulated that the basis for change might have been prewar and postwar outcomes for World War I. Economic activity in America at that time heavily relied on the factory model; specialization in careers and schools reflected this philosophy. During the industrial boom, specialization of particular subjects became increasingly evident. Prior to this time, departmentalized education was a reference to students receiving instruction from various teachers who taught art, music, or physical education. In the 1930s and 1940s, the use of either self-contained or

departmentalized organizational structures was the hottest educational debate of the day (Silberman, 1970). Departmentalization increased in popularity during the 1950s, especially in the intermediate levels, but the debate about education models has lasted for nearly 100 years (Silberman, 1970).

Articles were sought on the Internet using Virginia Tech search engines of EBSCO, Illiad, and Google Scholar, which covered all educational levels from special to tertiary education. Unfortunately, after a thorough literature search, it was determined that most of the studies were conducted before 2000 and very few were peer-reviewed. These facts made the relevance of this study more urgent. With the present focus on student outcomes, current research on the effectiveness of self-contained and departmentalized organizational models on students' academic performance is critically needed.

### **Purpose of the Study**

There is a wide range of organizational models available to school administrators. The principal usually has the prerogative to select the organizational model that best addresses the educational needs of the students in his or her school. Altering student organizational models to enhance classroom learning is very important to educational leaders in the 21st century. Each model has advantages as well as disadvantages.

The purpose of the study was to identify the organizational model, either departmentalized or self-contained, that had a significant difference in measures of students' academic performance on reading and mathematics VSL pass rates for fourth graders in Region II of Virginia. Research-based data from this study can be used to determine the more effective classroom organizational model based on student outcome

data, and supporting data about delivery methods can be used to improve students' academic achievement. With accountability at the state and district levels determined by the results of standardized measures, the current study data are crucial to helping administrators identify an effective organizational model.

### **Research Questions**

The research question identified for this study focuses on whether there was a difference in outcomes from the organizational delivery models—self-contained or departmentalized—and if so, which produced the greatest improvement in Virginia fourth-grade students' math and reading achievement pass rates as measured by the Virginia VSL. The overarching research question follows: What impact do the organizational models of self-contained and departmentalized classrooms have on the academic performance of elementary children? From this question, the following subsequent research questions were developed:

- Q1.** What differences, if any, exist in the 2009–2010 school year's Virginia Standards of Learning mathematics pass rates of fourth-grade general education students in schools with different classroom organizational models (self-contained or departmentalized)?
- Q2.** What differences, if any, exist in the 2009–2010 school year's Virginia Standards of Learning reading pass rates of fourth-grade general education students in schools with different classroom organizational models (self-contained or departmentalized)?
- Q3.** What effect, if any, does controlling for the school size of the student population have on the comparison among schools with different classroom

organizational models (self-contained or departmentalized) for effects on fourth-grade general education students' pass rates on (a) the 2009–2010 Virginia Standards of Learning reading and (b) the 2009–2010 Virginia Standards of Learning math ?

- Q4.** What effect, if any, does the presence or absence of school-wide Title I status (40% or more of its students come from families who qualify as low income under U.S. Census definitions) have on the comparison among schools with different classroom organizational models (self-contained or departmentalized) for effects on fourth-grade general education students' pass rates on (a) the 2009–2010 Virginia Standards of Learning reading and (b) the 2009–2010 Virginia Standards of Learning math?

### **Organization of the Study**

The study is organized into five chapters. Chapter 1 includes an introduction to the study, definitions of self-contained and departmentalized models, assessment and accountability standards, historical background to the problem, purpose of the study, mathematics and science performance, research questions, and organization of the study. Chapter 2 includes a review of related literature. Population, data collection methods, and research design are included in Chapter 3. The analysis of the research data and the findings are presented in Chapter 4. Chapter 5 includes a presentation of conclusions based on the findings, with discussion on the implications of the findings and recommendations for future studies.

## **Chapter 2: Literature Review**

The U.S. education system aims at addressing the diverse needs of students as a strategy to meet the demand for higher student achievement. Among the mechanisms of the U.S. education system is the enactment of the NCLB Act of 2001, which demands evidence of student achievement in each respective locality. While the responsibility for high student achievement rests on respective school administrators, empirical evidence for organizing an effective education system model is necessary. However, a review of literature about organizational influences on academic achievement reveals little empirical evidence since the 1970s and 1980s that an organizational model can guarantee success because of the peculiarity of each school environment.

School leadership is important in the development of effective organizational models. However, one of the key challenges for this review of literature was the limited research focused on elementary school populations, as the majority of research focused on either much younger students or mature students enrolled in either secondary or tertiary levels of education. This literature review includes peer-reviewed research on the relationship between elementary organizational models and student achievement.

The researcher's interest in the current study developed from being an administrator in a kindergarten through fifth-grade (K–5) school in which self-contained and departmentalized models for intermediate elementary education levels were implemented. The literature reviewed was limited to educational model developments of the last 50 years, not as an intention to diminish earlier efforts, but rather to streamline the literature review for the research.

The organizational model issue is one that is readily recognized as a critical concern among educational professionals. In the research by Akin-Little, Little, and Laniti (2007), the authors investigated the organizational practices between the United States and Greece and indicated significant similarities in classroom organization principles. This similarity was interpreted as an indication of common classroom organization concerns and professional perspectives in practice. This cross-cultural commonality was an opportunity for large-scale empirical research to validate and improve existing elementary classroom models.

The experts at the U.S. Department of Education (2004) recognized the importance of research efforts involving effective classroom models because of their long-term potential and direct impact on improving student performance and achievement. Such studies have been used to provide an opportunity to determine actual organizational models that were congruent with federal and state-level policies such as the NCLB program and VSL, respectively (Bruce, Salzman, & Snodgrass, 2002).

The experts in the Corporation for Public School Education in Round Rock, Texas, associated student achievement with educational productivity by showing the continuing utilization of traditional education perspectives (Zvoch, Letourneau, & Parker, 2007).

Use of these traditional classroom models was not sensitive or responsive to students; rather, very structured and didactic perspectives regarding education were followed. As the first elementary classroom models focused solely on basic literacy, these structured models were very efficient educational programs (Zvoch, Letourneau, & Parker, 2007). Little distinction existed in the research on the advantages of self-

contained classrooms over departmentalized models, although the latter was associated with private schools attended by affluent populations.

López (2007) characterized these traditional models as results oriented, framework based, and productivity focused. This did not imply that such models were not relevant to existing educational needs, but rather that interaction and involvement of parents, teachers, and students tended to be structured and role based. Other researchers also suggested that in traditional educational models, responsibility for the quality of education was placed on teachers (Gimbert, Bol, & Wallace, 2007). Traditional classrooms were highly structured and subscribed to the traditional educational roles of students and teachers. These roles were highly prescribed. The prevailing views were that learning was linear in nature or that the direction of learning came from teachers to students.

The need to adopt a departmentalized model existed because of the use of more complex curricula, rather than basic education requirements. The ambiguity of classroom standards was a challenge to standardized measures of performance, which in turn created difficulty in establishing regulatory and quality measures. This resulted in the institution of federal government educational standards for public schools that included achievement testing to measure the effectiveness of curricula and students' rate of development (Stewart, 2008).

Sauers and Walker (2004) believed that developments in technology and changing social dynamics were altering communication and learning models and thus were a challenge to the continued relevance of different organizational approaches. The authors' concern extended to both departmentalized and self-contained instruction models, but it

primarily focused on students studying a business communication course. Sauers and Walker concluded that student achievement could be directly associated with the inclusion of interdisciplinary approaches or a hybridization of teaching strategies. They suggested that classroom delivery models were not the determinants of students' achievement.

A Sauers and Walker's (2004) study was focused on more mature students and provided limited basic education profiles of the study participants, determining whether participants' previous organizational model experience had effects on their performance was difficult to determine. These developing trends are a few examples of the evolution of perspectives in educational instruction used to substantiate new policies, regulations, and principles for evaluating student achievement.

The development of nontraditional classroom models was not a new concept. However, these models became more institutionally recognized after the establishment of universal standards for educational professional practice and for student achievement. Dijkstra, Kuyper, van der Werf, Buunk, and van der Zee (2008) noted that although weaknesses and limitations of traditional classroom models were a factor in the development of nontraditional classroom models, the greater motivation was increased student achievement. Administrators in private educational institutions aimed to increase student achievement by developing extensive curricula with a number of teachers managing individual subjects. Though the model reflected a pattern of departmentalization, the primary motivation behind the specialization was an emphasis on the professionalization of education services (Pianta, Belsky, Vandergrift, Houts, & Morrison, 2008).

Croninger and Valli (2009) suggested that the more significant shift in traditional perspectives in elementary classroom delivery models was the recognition of the need to combine varying strategies to increase efficiency in educational interventions. Although the perspectives of educators until the early 1980s emphasized subscription to specific models, subsequent efforts sought to combine learning strategies and incorporate strategies from other disciplines such as psychology, management, and other social sciences. This integration has often been characterized as a progressive view on organizational models. Kilpatrick, Dean, and Kilpatrick (2008) suggested that these approaches developed from concerns that teachers and other educational professionals needed to reengineer not only learning strategies and performance standards but also the philosophical principles.

Stewart (2008) provided evidence regarding the principles, which included recognizing individual-level predictors of performance and conducting secondary analysis of National Educational Longitudinal Study databases in the formulation of classroom policies and models. Stewart (2008) indicated that individual-level performance predictors were interactive with school environments in which students created associations and relationships that served to reinforce learning.

Stewart's arguments suggested that education professionals and administrators needed to focus on organizational delivery models rather than the development of general instructional models. Decker and Bolt (2008) reinforced early evidence of large-scale assessment systems to measure student achievement based on prescribed performance standards. They articulated that the results of large-scale achievement assessments

could be used only as general guidelines and did not necessarily have relevance for organization models or interventions.

In a longitudinal study, Pianta et al. (2008) determined that regardless of the organizational delivery model, math and reading could be significantly improved by the availability of such support systems. Although this required modification of traditional educational models, the objective of enhancing achievement and performance remained central to the rationale. Huang (2010) characterized these developments as hybridization of educational models, which could be applied to traditional educational settings and to educational programs for children with special needs, whether for exceptionalities or disabilities.

In the past decade, significant efforts have been made to diversify educational programs to support individual classroom organization. Government officials as well as private sector experts have initiated these efforts through funding research, developing communication and collaboration channels, and improving public awareness regarding critical education issues. López (2007) reported that implemented policies emphasize the need for productivity, which highlights the adoption of strategic management principles. To support the adaptation of such principles, government officials have utilized legislation and professional regulation. It seems that educational reform was being supported by both socially and politically controlled mechanisms, which in part would have justified the economic investment in the implementation of reforms.

As mentioned earlier, the role of education professionals has been emphasized in the development and adaptation of new policies and practices. Stichter et al. (2009) stated that “strong classroom management and the use of high rates of Opportunities To

Respond (OTR) have been two advocated classroom practices to positively impact student performance” (p. 68). They suggested that schools should continue to have a strong relationship to OTR and to strengthen general education.

As shown by research among preschool teachers managing blended classrooms with children who need special instruction, the critical role of teachers is not only in learning but also in developing support systems for students within the school and with their respective families (Grisham-Brown, Pretti-Frontczak, Hawkins, & Winchell 2009). Current research has indicated that both self-contained and departmentalized organizational models place much of the responsibility for performance intervention on lead teachers, suggesting that professional intervention has a direct impact on student achievement.

The research developed by Huang (2010), who combined e-learning and traditional classroom learning, indicated that models being designed in response to educational reform were still in the process of development or transition; evaluating to what degree they supported or differed from traditional organizational models or how much they were aligned with either self-contained or departmentalized organizational models was difficult. Huang (2010) suggested that because education professionals determined and delivered actual learning interventions to improve student performance and achievement, they needed to apply insights and experience in general guidelines and policies to establish performance standards. Huang thought performance and achievement standards should be developed from actual research and experiences with organizational delivery models rather than from standards being prescribed to classrooms for their compliance.

## **The Role of Education**

The focus of education in the United States for the past two decades, following documents such as *A Nation at Risk* (U.S. Department of Education, 1983) and the NCLB Act (2002), has been on closing the achievement gap and creating equitability and accountability across school divisions through standards and standards-based testing:

For the past decade, the United States has focused nationally on closing achievement gaps between the lowest- and highest-performing students—a legitimate and useful agenda, but one that skirts the competitive demand for advanced skills, thus leaving us behind in the global achievement gap.

(Partnership for 21st Century Skills, 2008, p. 8)

As stated in *Democracy at Risk* (2008), “twenty five years after the release of *A Nation at Risk* (1983), the U.S. education system and our democracy are even more at risk” (p. iii).

As U.S. leaders were focusing on the achievement gap among ethnic groups, a global achievement gap was widening among students in the United States and “international peers in competitor nations” (Wagner, 2008, p. 8). The economic, social, political, and technological changes that had ignited the global achievement gap were “...powerful and until we understand them and rethink what young people need to know in the twenty-first century and how they are best taught, our future as a country remains uncertain” (Wagner, 2008, p. 9). By emphasizing skills such as problem solving and integrating them with book knowledge, teachers and other stakeholders in education can equip students with the tools needed to evaluate the various sources of information with which they are inundated, to the end of becoming self-directed learners and problem solvers.

Over the past 50 years, the expectations of the educational system have changed along with changes in society, as noted by November (2010):

At this point in the history of formal education, a change is occurring. Whereas before we gathered knowledge to become intelligent, now intelligence is measured by how well we apply knowledge to ask the right questions about how to solve the world's problems. (p. 208)

Although most students in the Industrial Age, who learned only the traditional three "R's"—reading, writing, and arithmetic—were successful as adults, all students in the Information Age require both traditional and applied skills, such as problem solving, to become effective citizens and to critically analyze the plethora of information from a wide variety of sources. Silva (2008) stated, "Proponents [of 21st century skills] point to the new workforce reality that demands a next generation of college students and workers who are independent thinkers, problem solvers, and decision makers" (p. 630).

Several studies have investigated the best type of organization for delivery instruction in core subject areas at the elementary level (Canady & Rettig, 1995; Catledge-Howard et al., 2003; McGrath & Rust, 2002). With the 2007 reauthorization of the original 2001 NCLB Act, 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, 2007).

Moreover, 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 (Williams, 2009). Released in 2008 by the U.S. Department of Education, *The Final Report of the National Mathematics Advisory Panel*, probed into the value of mathematics specialists at the elementary level. The authors found no difference in the mathematics achievement pass rates 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 following:

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. (U.S. Department of Education, 2008, p. 44)

With the recent spotlight on specialized math teachers and the need to provide students with strong mathematical knowledge, it is imperative that educators address the organizational structure options for the elementary school as a possible alternative to

increase academic achievement in all areas (Williams, 2009). According to the article, *The Facts About Math Achievement* (U.S. Department of Education, 2006), “America’s schools are not producing the math excellence required for global leadership and homeland security in the 21st century” (para. 1). With the challenge to maintain NCLB goals and focus on mathematical concerns, administrators and teachers must address the best teaching structure to produce the greatest level of student achievement. The administrators may respond to the educational urgency through the design of organizational delivery models that will hold schools and teachers accountable for transmitting 21st-century skills to their students through either a self-contained or a departmentalized organizational model.

### **Implications of Virginia Standards of Learning**

Officials at the Department of Education of the Commonwealth of Virginia established the Virginia Standards of Learning (VSL) as standards and expectations of performance of the state’s K–12 public schools (VDOE, 2005). The standards of learning were considered the culmination of the perspectives and concerns of public stakeholders in the education process, including educational professionals, parents, private enterprise leaders, and the public. English, mathematics, science, and social studies standards were considered the critical areas of achievement. For elementary students, English and mathematics assessments occur each year beginning in third grade and continuing through eighth grade; science and social science assessments are conducted during the third, fifth, and eighth grades. Subsequent testing as a measure of cumulative competence occurs at the end of specific courses during the high school years. The students’ pass rates on VSL resulted in verified credits needed for graduation.

Current VDOE reports indicate that the VSL's have been instrumental in the realization of NCLB program milestones (VDOE, 2010). From the standards' inception in 1995, and the 1997 adaptation by the Standards for Accrediting Public Schools in Virginia, completing the achievement requirements for all four key discipline areas has been critical. Elementary and high school students' performances have been enhanced, as has the rated competency of collegiate students, thereby significantly reducing the need for remedial support during their freshman year (VDOE, 2005).

According to Decker and Bolt (2008), these results gave credence to the value of establishing standards of performance as a motivation for the development of more effective classroom delivery models. The regularization of standardized evaluation or the establishment of specific criteria of performance streamlines learning objectives and interventions. Decker and Bolt recognized that the successful use of VSL could not be fully attributed to singular standards of achievement because of the influence of programs such as NCLB.

In the case of the implementation of either self-contained or departmentalized classroom models, the VSL have been overlying objectives. The idea has been that the achievement standards took precedence over the organizational delivery models that were utilized. Thus, the rationale behind self-contained classrooms, in which the need for personal engagement of students was emphasized, could not take precedence over academic performance. Achievement-focused standards might be viewed with a low level of sensitivity for student-teacher relationships and the special needs of students. In the case of departmentalized models, achievement focus on a limited number of disciplines might be viewed as an intention to diminish the resources or effort in other

subjects that were not considered critical areas of achievement (Diamond, 2007; Suter & Giangreco, 2009; Young, 2005).

### **Historical Overview of Departmentalized and Self-Contained Classrooms**

During the 1920s and 1930s, several educational reforms were taking place in the United States, particularly in the elementary schools. These reforms resulted in an increase in elementary enrollment, the addition of new subjects to the curriculum, and an extension of the school day. John Dewey and other educational authorities, as cited by Wiles and Bondi (1984), observed, “schools as agencies of society designed to improve our democratic way of life” (p. 268).

In Wiles and Bondi (1984), 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” (p. 268). On October 4, 1957, at the height of the Cold War between the Soviet Union and the United States, the Soviets launched Sputnik, the first fabricated satellite, into orbit around the Earth. This surprise achievement created a crisis in the states that eventually lead to the creation of NASA and the Apollo program to put a man on the moon before the end of the sixties. However, with the launching of Sputnik, the math and science curriculum was adapted to meet the pressing needs to excel in science, math, and modern foreign languages. Thus, school administrators began to make adjustments to the organizational structure of elementary schools to coincide with the new curriculum (Wiles & Bondi, 1984).

In the past, the traditional, self-contained classroom structure was considered the basic norm arrangement for many school divisions. 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, 1967). 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” (Canady & Rettig, 1995, Garcia, 2007).

In 1970, Walters strongly disagreed with the trend to modify the traditional, self-contained classroom. He expressed his opposing views to the alternative departmentalized setting using four educational concepts, which strengthen 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. 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 were self-contained with the percentage of such classes dropping at each successive level” (p. 113).

Another finding indicated that the smaller schools had a higher percentage of classes using the traditional model over the nontraditional, 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 (Culyer, 1984; Elkind, 1988).

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. The teacher in a traditional classroom setting is responsible 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 that an elementary traditional, self-contained teacher is equally competent in all these academic areas, as an expert or a generalist (Bezeau, 2007; Chan & Jarman, 2004). 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). The report further implicated that 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, arguing that in order to meet the needs of the whole child in one classroom setting, students require a special connection with an individual teacher (Myers & Pianta, 2008).

## **Departmentalized Classrooms**

Several studies investigated the use of either a departmentalized or a self-contained structure in schools (Bezeau, 2007; Canady & Rettig, 1995; Garcia, 2007). The departmentalized structure is most often used in research to describe classrooms in which students have more than one teacher for core academic subjects. Elementary, middle, and high school levels implement this type of structure (Chan & Jarman 2004; Garcia, 2007). 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).

Departmentalization of classes for instruction is the most preferred type of classroom organization for instruction at the middle school and high school levels, although the elementary level also uses it sometimes. According to DeIViscio and Muffs (2007), a departmentalized class is “a team of teachers working as subject-area specialists” (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).

A departmentalized class structure is one in which students can learn from subject area experts who each have specific knowledge in one subject area. The students can study a subject in a more in-depth manner to learn new facets of that single subject. This specific organizational model is used generally in middle and high schools rather than elementary schools. Students in these higher grades are given more specificity of subject matter in preparation for a more imminent adulthood (Greenfield & Klemm, 2001).

Parker (2009) stated that departmentalized instruction consisted of specialized teachers in a subject matter rather than whole child orientation. Although it can be construed as a negative assessment, teachers in secondary schools must be available to the student as experts in the subjects they teach. Being subject experts means that teachers are focused on the subject, but it does not necessarily mean an inadequate focus on the student (Parker, 2009). Students in either elementary or secondary schools with a departmentalized structure showed that while departmentalized students' ratings on a Likert scale on items assessing personalization, participation, independence, investigation, and differentiation increased, self-contained students' ratings declined (Harlin, 2009).

As students leave childhood and enter adolescence, they leave behind a dependent psychosocial mode and enter a stage in which dependence on self rather than on others is an important concept to internalize. Many studies have shown that self-concept, self-esteem, and independence measures are affected significantly by a student's entering a departmentalized classroom structure (Harlin, 2009; Parker, 2009; Parker & Neuharth-Pritchett, 2009). In a majority of cases, the student's perception and implementation of these important personality traits were significantly heightened (Parker, 2009).

The challenges involved in the transition for students leaving elementary school, where there typically exists little departmentalization, to the middle school, where departmentalization is the primary structure, have often been noted by scholars (Chan, Terry, & Besette, 2009). Several studies suggest that achievement losses frequently result when transition (from self-contained to departmentalized) negatively affects students' self-concept of ability and value in academic disciplines (Reuman, 1989).

Academic difficulties in language learning (Alspaugh & Harting, 1995; Grooms, 1967; Lamme, 1976), mathematics (Alspaugh & Harting, 1995; Grooms, 1967; Reuman, 1989), and social studies (Alspaugh & Harting, 1995; Grooms, 1967) have also been cited as deterrents to implementing departmentalization.

The transition from self-contained to departmentalized classrooms involves a different type of transitioning from elementary to middle grade schooling. Among the obstacles created by elementary to middle school transitioning, the most significant appears to be social in nature (Blum, 2005; Pope & Simon, 2005; Tomlinson & Doubet, 2005). Alspaugh and Harting (1995) advised that schools should expect achievement declines in the transitional year when transitioning students from self-contained to departmentalized classrooms.

Departmentalization in elementary schools offers an excellent solution to the transition problem in addition to all the benefits of academic specialization (Chan & Jarman, 2004). However, many educators and parents are opposed to departmentalization in elementary schools because they see the advantage of keeping the classrooms self-contained to maintain the uniqueness of a home-like environment and the teacher's parental image (Chan et al., 2009). Self-contained classroom organization may be a good way to ease students from a home setting to a school setting. However, when students come to fourth and fifth grades, a change in academic organization is necessary to work toward a seamless transition from elementary to middle school (Chan & Jarman, 2004).

Departmentalization in fourth and fifth grade seems to offer a solution to address this issue (Chan et al., 2009). The departmentalized structure would also allow educators

to teach the breadth and depth of a subject, rather than subjects with which they may lack expertise. In this structure, students are learning content from someone with a strong background in the particular subject area (Catledge-Howard et al., 2003).

Elementary school structure is an issue debated by educators and administrators (McGrath & Rust, 2002). One aspect of organizational structure involves the number of subject areas one-teacher covers in the classroom. In the more traditional, self-contained classroom, the teacher is expected to carry the responsibility of curriculum for the entire day. The other side of organizational structure is the departmental approach. This is often referred to as the four-teacher model. In this approach, the teachers teach specific content areas and the students move from classroom to classroom during the day (Dropsey, 2004).

Advantages of departmentalization include specialization, instructional teams, teacher retention and transition to middle and high school, and flexibility (Chan & Jarman, 2004). Specialization allows for better utilization of instructional time. Instructional teams can be formed to integrate subject content across the curriculum. Teachers are able to complete more in-depth lessons in a specific area, which may result in greater stability for students. Transition from elementary to middle school and middle to high school is more easily achieved with departmentalization.

Departmentalization increases the opportunity for teachers to be involved with more students, thus improving interpersonal skills through adapting to different teaching styles. Teachers are able to cover more of the state standards by specializing in only one content area.

When grade levels are departmentalized, mostly subject areas have equal time, which can be more time efficient. In one rural elementary school, teachers discussed the fact that they are required to document each standard and the date it was taught. A curriculum director keeps weekly records of each teacher and the standards they teach. Departmentalizing cuts down on the amount of time teachers spend recording standards taught for each subject. When teaching one subject, they are required to record only standards for that area (Dropsey, 2004).

Few people would argue that teachers must know the subject matter they are teaching. This is one of the main issues supporting departmentalization in elementary schools. The underlying reason for departmentalization in many schools is the demand to meet standards, indicators, and benchmarks of the curriculum. Administrators and teachers indicate that curriculum standards are better met if each teacher specializes in only one subject area. In-depth study in elementary school science and social studies cannot be accomplished without some type of departmentalization (Alabama Administrative Code, 2003). Higher test pass rates in some districts are attributed to departmentalizing the grade levels. Positive changes in test pass rates have been evident in schools using this structure. Administrators and school boards often buy into any innovation that claims to raise test pass rates (Fege, 2004).

Successful departmentalization in elementary schools results from the amount of preparation involved. Science, social studies, and math may not be covered in depth without departmentalizing. The departmentalization allows teachers to maximize resources and preparation time. Teachers must have an adequate understanding of the subject they are expected to teach, and as they teach, they become even more

knowledgeable of that particular subject (Flick & Lederman, 2004). A disadvantage of departmentalization is that when students change teachers several times a day, they may not relate to any of their teachers as well as they would to one teacher. The research that does exist on departmentalization suggests that this type of structure has negative effects for elementary children. Several studies have found that elementary students in departmentalized classrooms show lower levels of achievement than students in self-contained classrooms (Canady & Retting, 1995).

Chan et al. (2009) expounded upon 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. (Chan et al., 2009, p. 12)

### **Effect on Student Achievement in Departmentalized Model**

Anecdotal evidence indicates that students achieve more academically in self-contained classrooms than in departmentalized classrooms. However, research has not substantiated this claim. McGrath and Rust (2002) found that there was no difference in

instruction time between self-contained and departmentalized classrooms. McGrath (2002) indicated that on the fourth grade mathematics subtest of the achievement data, “no significant differences were found on student achievement between departmentalized and self-contained classes” (p. 1). While an equal level of achievement in one subject area does not matter significantly, the lesson-learning gap assumption was not accurate.

Studies show an achievement loss when students transition from elementary school to high school. Newman, Newman, Griffen, O’Connor, and Spas (2007) associated the following negative outcomes with the transition from junior high to high school: (a) poorer attendance and declines in grade point average; (b) discipline problems associated with experiencing change to a new school building, moving from self-contained to departmentalized classes, or encountering a different educational philosophy; and (c) decreased participation in extracurricular activities. However, some disruptions in school achievement, behavior, and self-concept are linked with school transitions. As such, the more school transitions a student encounters, the more likely it is that the student will show evidence of the negative consequences noted (Alspaugh, 1998).

This phenomenon also has been noted in the transition from elementary to middle school (Chan et al., 2009). The problem appears to be twofold: Students move from a known environment, in which most have been surrounded by the same classmates for several years, into an environment in which interaction with teachers is at a minimum, independence is prized, and there is a new style of learning (Greenfield & Klemm, 2001). Some researchers have suggested that school leaders expect a decline from students

during this transition (Chan et al., 2009) and that school administrators should find ways to mitigate the change.

One suggestion from the literature is that elementary school leaders begin helping students practice the transition while they are still in a relatively “safe” environment. Chan et al. (2009) found that “departmentalized fourth and fifth grade students...better adapted to the middle school setting than their peers who attended fourth and fifth grades in self-contained classrooms, based upon faculty reports, as well as scores from the state criterion-referenced competency test” (p. 11). Some schools have a program in which students gain more class choices as they move through the elementary school grades; other schools have separate classes for subjects such as art, music, and reading. Research shows that students who remain with the same classmates feel more supported and are better able to maintain their class standing (Newman et al., 2007).

Other researchers have supported the notion that drops in scores on self-confidence measures were almost exclusively due to the transition between school settings rather than the differences between class structures (Chan et al., 2009; Harlin, 2009). Evidence has shown the same decline among students transitioning between middle school and high school (Newman et al., 2007), thus it is difficult to conclude that scores related to confidence, worth, and other factors are the result of a change of classroom type.

Another reason to doubt that academic declines are simply due to a change in classroom type is that teachers may find it difficult to stay current on a multitude of subjects. Some educators have found that departmentalized organizational approaches offer distinct advantages for the student (e.g., Culyer, 1984). Anderson (1962) presented

a strong case for specialization when he reported that only 4 of 260 teachers considered themselves well prepared in all subject areas. Walker (1990) noted greater emphasis on curriculum matters in departmentalized elementary schools.

McGrath and Rust (2002) learned that “only 4 of 260 teachers [ Anderson studied] considered themselves well prepared in all subject areas...[with a] greater emphasis on curriculum matters in departmentalized elementary schools” (p. 42). Some elementary schools have switched to a quasi-departmental concept because teachers are more comfortable with the transition. In this case, the students have one primary teacher, with other teachers who join the class during the assigned scheduled subjects. Depending on the expertise of the primary teacher, therefore, the students might have separate math, science, or history teachers in the same manner as they would have specific art and music instructors. This organization more closely resembles the instructional team concept that is used in many middle schools (McGrath & Rust, 2002).

Teachers in instructional team teaching settings have more support because they are part of a team and do not handle student difficulties alone (Parker & Neuharth-Pritchett, 2009). Educators’ comfort levels with material and actual abilities to communicate in the different subject areas have significant bearing on whether students can achieve proficiency in the subjects. Teachers who are uncomfortable teaching specific subjects will show a bias against those subjects. Therefore, this setting may help improve student transitions between different grade levels that require a change in school level (McGrath & Rust, 2002).

Other researchers, such as Cook and Rushton (2007), believed that the change should be in the other direction. A switch from self-contained classrooms to a

departmentalized structure may have benefits, yet studies have shown otherwise.

Greenfield and Klemm (2001) conducted research and concluded the following:

Educational goals have shifted: schools now include a greater diversity of students and aim to educate all of them to much higher standards of learning in a world with rapidly changing educational demands. To do this effectively requires shifts in both school structure and function. Schools must become smaller, less hierarchical, more personalized, and less departmentalized. Teachers must teach for understanding rather than simply for breadth; for this they must be better trained not only in their subject areas but also in child development, student learning styles, diverse strategies for teaching and assessment, and collaborating with each other. (p. 15)

The contention is that education should be geared toward a student-centered approach. If research has determined that students are more comfortable with a certain type of classroom environment, and students achieve better without any lapses in that environment, then that system should be the norm throughout the students' school careers.

The opposing argument, also found in the research literature, is that students do not achieve goals related to independence and self-confidence in the self-contained model (Chan et al., 2009). As elementary and secondary school leaders aim to foster both educational and psychosocial outcomes, educators have difficulty in deciding which course of action is better.

## **Self-Contained Classrooms**

Essentially, the NCLB statute requires that all students participate in standardized tests to rate and rank a school's performance. As this assessment procedure was nationally enforced, teachers who instructed struggling students with various cognitive challenges frequently had low test-score averages, while teachers who instructed average or honors students had higher scores. Subsequently, many schools began placing a greater number of struggling students in self-contained classrooms to ensure that specific class test-score averages remained high (Chen, 2009).

Self-contained classrooms allow students to become well acquainted with the teacher. The teacher becomes aware of students' strengths, weaknesses, and personality traits. Additionally, self-contained classes allow for more flexibility in scheduling and less transition time. A self-contained classroom generally consists of one instructor who is a generalist and teaches every content area, although in elementary school settings, there are often "specials" that are taught by teachers in a particular field such as music, art, and physical education. This setting is still common for students with special needs, students in alternative schools, and students at the elementary level. On rare occasions, students that are identified as gifted attend self-contained classes (Hayden, 2007).

Self-contained classroom teachers have more opportunities to learn the strengths, weaknesses, and learning styles of their students (Cook & Rushton, 2007). There is more flexibility in the schedule and a better chance for integration of the different content areas. Students in the self-contained classroom have more actual time in the classroom because they are not losing time moving to another setting (Catledge-Howard et al., 2003; McGrath & Rust, 2002).

A study of McGrath and Rust (2002) involving fifth and sixth graders in departmentalized and self-contained classrooms found that students in self-contained classrooms made significant gains on the Tennessee Comprehensive Assessment Program (TCAP) in the total battery and language and science subtests. However, there were no significant differences in the math, reading, and social studies subtests (Catledge-Howard et al., 2003; McGrath & Rust, 2002).

A study by Alspaugh and Harting (1995) also found that four out of five groups of students who transitioned from self-contained to a departmentalized structure experienced a significant decline in their reading and math scores. According to Piirto (2004), students who have been identified as gifted and are in self-contained settings score higher in this environment than when they are not.

In a self-contained classroom, public schools generally try to keep the student-teacher ratio low, as the teacher often has to provide each student with one-on-one assistance and support. Students provided with self-contained instruction may spend their entire school day or part of their day in this setting or they may only receive self-contained support periodically. Each case is uniquely adapted to meet the students' needs (Chen, 2009).

Due to the unique demands of all students enrolled in public schools, many educators have found that self-contained classrooms provide a more positive and supportive environment for academic, personal, and even social development (Chen, 2009). Traditionally, outside of the elementary setting, self-contained classrooms were intended to help students who demonstrated special needs or to assist students who were struggling with classes or curriculum content. However, as the achievement gap among

students continues to widen, many public schools question whether self-contained classrooms are the best avenue when considering student learning and support (Chen, 2009).

Elementary classrooms are the classic self-contained structures. The children of a particular class have one teacher who is with them throughout the day. The only reason they may leave that primary instructor is to take peripheral classes such as art, music, and physical education. Early research reported that the self-contained organizational structure allows for more instructional time because of a lack of class transition (Harris, 1996).

Parker (2009) described self-contained organizational structures in regular education classes as ones in which the students have one teacher who is responsible for the majority of their instruction. Although a very common structure in the elementary grades for all classrooms, self-contained classrooms are not used extensively in secondary schools, except for specialty classes such as special education and those for gifted learners (Parker, 2009). Thus, student achievement was significantly higher in some subject areas for students in self-contained settings than for those in departmentalized settings (Harris, 1996).

The primary argument for self-contained classes, and the reason that this structure is used with elementary age students, is that it is a child-centered approach (McGrath & Rust, 2002). Younger students usually need to feel comfortable with their teacher and have the ability to trust and know that teacher. Elementary age children are in a developmental stage in which they are just starting to learn about themselves and the surrounding world. In a departmentalized setting, children, especially the very young,

would be more confused and less likely to absorb the required knowledge. With the same classmates and teacher(s) constantly surrounding them, young students feel free to learn (McGrath & Rust, 2002).

Individual teachers in self-contained classrooms better understand their individual students' learning styles (McGrath & Rust, 2002). Canady and Rettig (1995) revealed the following:

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)

Self-contained classes allow teachers to understand what each child needs, thus leading teachers to work with each child in a specific way so as to help that student learn more efficiently. Self-contained classroom teachers can make changes to the schedule as needed (McGrath & Rust, 2002). While the departmentalized classroom teacher has the students for such a short period of time that the entire class time is needed for instruction, teachers in self-contained classrooms can give students necessary breaks, and they can be more creative with their allotted classroom time. In self-contained settings, students have the advantage of being able to shift to an outside classroom or have a field trip (McGrath & Rust, 2002).

One argument that researchers have made with regard to using this class structure model in secondary schools is that the instruction is subject centered, not student centered (Hackmann, 2004). The preferred classroom management technique in most high schools is a behaviorist approach, which is focused on the content being taught rather than on the students in the classroom (Hackmann, 2004).

In this approach, the message is communicated, but many students are left with incomplete knowledge of a subject because they cannot learn at an individualized pace. To counter the gap in student learning, a “different view of learning has emerged—constructivism—that emphasizes the student’s role in the learning process” (Hackmann, 2004, p. 74). Hackmann (2004) added the following:

This type of learning is best suited for a self-contained classroom setting because it is based on the premise that individuals must be socially engaged in learning—actively creating knowledge from their existing knowledge base, beliefs, and personal experiences. Constructivists advocate learners’ participation in context-bound, real-world problem solving and call upon students to engage in metacognition. (p. 75)

A departmentalized setting can be used for this type of learning if the modules are longer; however, most secondary school leaders aim to increase the number of classes that a student attends each day, not lessen them. Some schools have as many as nine classes during a single school day. With that type of class schedule and the associated lack of sufficient time for the student, the student does not have time to think creatively or use his or her personal knowledge base, beliefs, and personal experiences as an addendum to the learning process (Hackmann, 2004).

The problem many teachers have with this departmentalized setting is that because of its ease of use in self-contained classrooms, it does not fit well into the secondary schools.

Teachers who are subject matter experts might like the idea of helping every student reach his or her true potential, but the practicality of the idea has limitations. Hence, the interdisciplinary teaming approach that is commonly used in middle schools could also benefit from this form of instruction (Hackmann, 2004).

Transition to the secondary environment is one of the primary reasons many education researchers advocate for departmentalized classrooms in the elementary school environment (McGrath & Rust, 2002), because of how middle school teachers build relationships, design instruction, and establish the classroom environment directly relates to young adolescents' adjustment to middle school (Parker & Neuharth-Pritchett, 2009). Moving to a departmentalized setting earlier may benefit students who are in self-contained classrooms, allowing for a smoother transition. The method of instruction that is conducive to students' higher achievement standards in academic testing should be the preferred model.

### **Effect on Student Achievement in Self-Contained Model**

The goal of any instructor is to assist students in learning to their full potential, and thus, achieving a higher standard in life. The reigning assumption is that self-contained classrooms are the preferred model relative to achievement, but the literature has not shown this in all cases. In a study conducted by McGrath and Rust (2002) with regard to this question, they found that the self-contained group gained significantly more on total battery, language, and science subtests compared to the departmentalized group.

In certain specified areas, and as a whole, the students in McGrath and Rust's (2002) study performed better in situations of instruction using the self-contained model. Teachers can give the students more individualized attention and students' test scores in some subjects demonstrated the efficacy of this teaching model. The only subjects in which no such difference was statistically significant were reading, math, and social studies (McGrath & Rust, 2002). Students were found to have performed better in language and science. This finding was significant, showing that the researchers found either gains or no difference in learning ability between the two different classroom models. The researchers concluded that the self-contained model is the preferred method overall as a result of the improved performance of students in the stated subject areas. Research was also conducted with students who had transitioned recently from a self-contained classroom structure into one that either was completely departmentalized or used the instructional team approach that was a hybrid of the other two models. These "young adolescents describe their middle school classrooms as having less autonomy, fewer opportunities for input, and fewer cooperative group interactions than found in their elementary classrooms" (Parker & Neuharth-Pritchett, 2009, p. 23). The students found it difficult to express their opinions, which hampered their ability to learn (Cook & Rushton, 2007).

Many middle schools have adopted a transitional model that supposedly allows students to more successfully make the move to the higher grades. Using "instructional teams of 2–4 teachers, as opposed to departmentalized structures, [and decreasing] the number of students assigned to a teacher, makes it easier for teachers and students to get to know each other well" (Parker & Neuharth-Pritchett, 2009, p. 24). McGrath and Rust

(2002) determined that a student who knows and is more familiar with his or her teacher is more comfortable in the learning environment and is a more successful learner.

The debate has been that the self-contained organizational structure allows for more instructional time due to lack of class transition, arguing that student achievement is found to be significantly higher in some subject areas for students in self-contained settings than for those in departmentalized settings (Chan et al., 2009). For the “mathematics subtest of the achievement data, there were no significant differences in student achievement gain scores between departmentalized and self-contained classes” (McGrath, 2002 p. 1). Although significant differences in student achievement showed in some subject areas based on how the students’ classrooms were structured for other subjects, the instruction structure did not have an effect. This would seem to be a significant argument in favor of using self-contained classrooms throughout a student’s learning career.

## **Conclusion**

Educators in both departmentalized and self-contained models can recognize and respond to critical education issues that require greater efficiency and quality of services. In both cases, some degree of limitation to implementation exists, and confidence in both models is reduced. According to the literature, departmentalized models involve a significant focus on structure and functionality, but they also involve less sensitivity to individual learning issues. Self-contained classrooms have a higher potential for response to individual learning, but this model might not be feasible for operation on a wide-scale basis or as a model for general curriculum. The effectiveness of either model

for wide-scale implementation in elementary schools has limitations, but existing research has shown how both models can be utilized for this purpose.

Researchers have indicated the many pros and cons of departmentalized and self-contained classroom settings. These organization delivery settings are debated in the current era of educational reform, particularly in the area of student achievement.

Educators have explored alternatives to improve the organization of public schools.

School-wide organization needs to be studied to provide supporting evidence for the effects of organization on student achievement to justify changes in educational divisions.

Patterns of organization for elementary schools have undergone many and varied periodic changes since colonial times. Researchers have indicated that departmentalization has been recommended in the intermediate grades almost exclusively; however, researchers have failed to produce conclusive answers as to whether or not a departmentalized pattern is more advantageous than a self-contained organizational structure at the elementary level. Many researchers have concluded that more studies are needed concerning the advantages or disadvantages of various organizational structures. Some studies indicated higher achievement for students in departmentalized classrooms, although others using comparable designs showed higher scores for students in self-contained classrooms (Young, 2005).

### **Chapter 3: Methods**

The purpose of this chapter is to explain the methods used to complete the quantitative research study. The study examined which organizational structure, self-contained or departmentalized, had the greatest effect on fourth-grade students' math and reading achievement as measured by VSL. A type of non-experimental, quantitative research known as descriptive research was used in the study. According to Gall, Gall, and Borg (2007), "Descriptive statistics have greatly increased our knowledge about what happens in schools" (p. 3). Researchers can use descriptive studies to gather data about various educational phenomena. "Some descriptive research is intended to produce statistical information about aspects of education that interest policy makers and teachers" helping to shape educational policy and initiatives that will improve existing conditions (Gall, Gall, & Borg, 2007, p. 301). Thus, descriptive studies may provide data that is a starting point needed to revolutionize programs or address policies to meet the needs of the 21st century's students and teachers. Today's educational leaders face no greater challenge than preparing our students for the challenges and problems of the unpredictability of the 21st century.

The purpose of the study was to identify the organizational model, either departmentalized or self-contained, that had a significant difference in measures of students' academic performance on reading and mathematics VSL pass rates for fourth graders in Region II of Virginia. Data from the study can be used to influence future decisions in education regarding the preparation and organization of schools. "Some descriptive research is intended to produce statistical information about aspects of education that interest policy makers and educators," which would help to shape

educational policy and initiatives that would improve existing conditions (Gall et al., 2007, p. 301). Descriptive studies are used to provide data as a format, whether in a type of program or policy. Modern educational leaders face no greater challenge than preparing students for the issues and problems of our unpredictable world.

### **Research Design**

Effective school organizational models have been identified as a critical variable for fostering student achievement (National Commission on Teaching and America's Future, 1996; Snow, Barnes, Chandler, Goodman, & Hemphill, 1991); therefore, the chosen research method was a quantitative method 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 from the Virginia Department of Education. This procedure was accomplished by the analyzing the 2009/2010 VSL mathematical and reading achievement data of the fourth grade students to investigate the cause and effect relationships of the two different types of organizational models. One quantitative component was a comparison of VSL pass rates in math and reading for self-contained versus departmentalized organizational models. The selection process consisted of a brief survey conducted electronically or via phone to school personnel. The survey had questions about the organizational model currently in place in their schools (see Appendix A).

### **Research Questions**

The predominant research question identified for the study was to determine any difference in student performance from the organizational models—self-contained or departmentalized—and if so, which could be used to produce the greatest difference in

student performance in Virginia fourth-grade students' math and reading achievement pass rates as measured by the VSL. The primary research question follows: What impact do the organizational models of self-contained and departmentalized classrooms have on the academic performance of elementary children? From this question, the following research questions were developed:

- Q1.** What differences, if any, exist in the 2009–2010 school year's Virginia Standards of Learning reading pass rates of fourth-grade general education students in schools with different classroom organizational models (self-contained or departmentalized)?

Null Hypothesis 1: There is no significant difference in the reading pass rates of fourth grade general education students in schools with different classroom organizational models.

- Q2.** What differences, if any, exist in the 2009–2010 school year's Virginia Standards of Learning mathematics pass rates of fourth-grade general education students in schools with different classroom organizational models (self-contained or departmentalized)?

Null Hypothesis 2: There is no significant difference in the mathematics pass rates of fourth grade general education students in schools with different classroom organizational models.

- Q3.** What effect, if any, does controlling for the school size of the student population have on the comparison among schools with different classroom organizational models (self-contained or departmentalized) for effects on fourth-grade general education students' pass rates on (a) the 2009–2010

Virginia Standards of Learning reading and (b) the 2009–2010 Virginia Standards of Learning math ?

Null Hypothesis 3: There is no significant difference in for the school size of the student population have on the comparison among schools with different classroom organizational models (self-contained or departmentalized) for effects on fourth-grade general education students' pass rates on (a) the 2009–2010 Virginia Standards of Learning reading and (b) the 2009–2010 Virginia Standards of Learning math

**Q4.** What effect, if any, does the presence or absence of school-wide Title I status (40% or more of its students come from families who qualify as low income under U.S. Census definitions) have on the comparison among schools with different classroom organizational models (self-contained or departmentalized) for effects on fourth-grade general education students' pass rates on (a) the 2009–2010 Virginia Standards of Learning reading and (b) the 2009–2010 Virginia Standards of Learning math?

Null Hypothesis 4: There is no significant difference the presence or absence of school-wide Title I status (40% or more of its students come from families who qualify as low income under U.S. Census definitions) have on the comparison among schools with different classroom organizational models (self-contained or departmentalized) for effects on fourth-grade general education students' pass rates on (a) the 2009–2010 Virginia Standards of Learning reading and (b) the 2009–2010 Virginia Standards of Learning math?

## **Data Collection and Analysis**

The purpose of the study was to identify the organizational model, either departmentalized or self-contained, that had a difference in measures of students' academic performance on reading and mathematics VSL pass rates for fourth graders in Region II of Virginia. All fourth grade students within Region II for the state of Virginia represented the population for this study. Students identified as having special needs, such as a reading or math disability, and other types of disabilities as identified by the state were excluded from the study. This exclusion is due to the fact that students with a disability (SWD) had an individualized educational plan with specific accommodations. These accommodations may have interfered with the test data since resource support was available to them beyond the organizational model, self-contained, or departmentalized. The test information needed for the study was obtained from the VDOE, the school division's Department of Accountability, and current building administrators or school personnel. The following school divisions were involved in the study: (a) Accomack, (b) Chesapeake, (c) Franklin City, (d) Hampton, (e) Isle of Wight, (f) Newport News, (g) Norfolk, (h) Northampton, (i) Poquoson, (j) Portsmouth, (k) Southampton, (l) Suffolk, (m) Virginia Beach, (n) Williamsburg/James City, and (o) York (all Region II Virginia school divisions). After obtaining the pass rates, a cluster model was developed to ensure like schools were clustered together in the results, reporting from the total of 230 elementary schools. Fourth-grade general education students in Region II of Virginia represented the population for the research study. Only 212 schools serve a K–5 student population; the remaining 18 serve a K–2 student population. The sample for the study included 19,741 fourth-grade students for the 2009–2010 school year in the 212 K–5

elementary schools residing in 15 school divisions in Region II Virginia. Prior to beginning this study, permission was obtained from the Institutional Review Board of Virginia Polytechnic Institute and State University's Office of Research Compliance (see Appendix B) to issue the instrument. Next, the survey was distributed to the participating Region II elementary administrators (see Appendix A). E-mails were sent to administrators at Region II elementary schools with the survey attached inviting them to participate in the study. Responses were sent via e-mail back to the researcher.

The data collected were measured and analyzed using the Statistical Package for the Social Sciences (SPSS) version 16.0. Findings of the study can be used to influence future decisions in education, such as the preparation of the organizational delivery model of self-contained versus departmentalized classrooms.

The 2010 spring archived VSL data were found on the VDOE website and used for analysis. An ANOVA was used to test the results, one with math VSL pass rates as the dependent variable, and one with reading VSL pass rates as the dependent variable. Two independent variables were used with each of these dependent variables: (a) original model self-contained and (b) original model departmentalized. Levene's test, an inferential statistic, was used to assess the equality of variances. In addition, a Shapiro-Wilk test of the departures from distributional normality of each dependent variable was conducted on the data. The Shapiro-Wilk is a test of the null hypothesis that a sample came from a normally distributed population.

All statistical analyses were performed using the SPSS version 16.0 software. The research analysis instrument used in the study was SPSS, a self-reporting instrument, to measure and identify which organizational model (i.e., departmentalized or self-

contained) had higher outcomes in measures of academic performance among elementary students, to aid educators' decisions in choosing an organizational instruction delivery model of either self-contained or departmentalized.

Figure 1 is a graphic explanation of the data methodology for the research.

<b>Overarching Question</b>	<b>Independent Variables</b>	<b>Dependent Variables</b>
What impact do the organizational models of self-contained and departmentalized classrooms have on the academic performance of elementary children?	Self-contained organizational model versus departmentalized organizational model	Math and reading VSL pass rates, size of student population, and Title I status.

*Figure 1.* Comparison of variables.

### **Timeline**

The following timeline was followed for data collection:

1. Surveys were distributed, electronically, to all elementary schools participating in the study.
2. Weekly reminders were sent to the principals or appropriate school personnel regarding returning the survey.
3. After 2 weeks of reminders, principals or appropriate school personnel not completing the survey were called individually.

4. Within 1 month of surveys being returned, ANOVA and post hoc comparisons were run.
5. Data from participating schools were held confidential and no school's actual data were revealed in the study.

Within 4 months of prospectus approval, findings were determined and the researcher was ready for defense.

Once defense is complete, the researcher will dispose of school data.

### **Conclusion**

The purpose of the study was to identify the organizational model, either departmentalized or self-contained, that had a significant difference in measures of students' academic performance on reading and mathematics VSL pass rates for fourth graders in Region II of Virginia. Fourth-grade students within the state of Virginia Region II represented the population for this study. The archived VDOE data were divided into two specific levels, students taught in a self-contained classroom or students taught in a departmentalized classroom. All students identified with special needs were excluded from this study. Methods and procedures used for the comparison of students' achievement outcomes in departmentalized classrooms with students in self-contained organizational models were presented. In this chapter, the research design, research questions, sample selection, site selection, collection and gathering procedures, instrument design, data treatment and management, data analysis techniques, and timelines were detailed. Reading and math VSL pass rates were examined for fourth-grade self-contained and departmentalized classrooms in Virginia. Building administrators were contacted electronically and asked to identify the organizational

delivery model for students in the fourth grade at specific school locations. The information was examined along with the VSL math and reading pass rates to determine if one organizational setting had greater results than the other regarding student achievement outcomes. The data obtained from VDOE test pass rates and surveys were analyzed with SPSS version 16.0. Results from data analysis and summaries of findings are presented and analyzed in Chapter 4.

## **Chapter 4: Results**

The purpose of the study was to identify the organizational model, either departmentalized or self-contained, that had a significant difference in measures of students' academic performance on reading and mathematics VSL pass rates for fourth graders in Region II of Virginia. The study findings can be used for future decisions in education regarding the preparation of the organizational delivery model of self-contained versus departmentalized classrooms in elementary schools. Archival data from the VDOE and from elementary schools throughout the state of Virginia were gathered to explore the effect of different classroom models (i.e., self-contained vs. departmentalized vs. combined), school size, and school-wide Title I status on the performance of fourth-grade students on the Virginia Standards of Learning (VSL) achievement tests.

Data analysis results are described using frequencies and percentages as presented in the descriptive analysis section. Statistical findings from ANOVA analysis also are presented. The chapter concludes with a summary of the statistical results.

### **Restatement of the Problem Statement and Research Questions**

The predominant research question identified for the study was to determine any difference in outcomes from the organizational models—self-contained or departmentalized—and if so, which could be used to produce the greatest improvement in Virginia fourth-grade students' math and reading achievement pass rates as measured by the VSL. The primary research question follows: What impact do the organizational models of self-contained and departmentalized classrooms have on the academic performance of elementary children? In this regard, the study was used to address the following four research questions:

- Q1.** What differences, if any, exist in the 2009–2010 school year’s Virginia Standards of Learning reading pass rates of fourth-grade general education students in schools with different classroom organizational models (self-contained or departmentalized)?
- Q2.** What differences, if any, exist in the 2009–2010 school year’s Virginia Standards of Learning mathematics pass rates of fourth-grade general education students in schools with different classroom organizational models (self-contained or departmentalized)?
- Q3.** What effect, if any, does controlling for the school size of the student population have on the comparison among schools with different classroom organizational models (self-contained or departmentalized) for effects on fourth-grade general education students’ pass rates on (a) the 2009–2010 Virginia Standards of Learning reading and (b) the 2009–2010 Virginia Standards of Learning math ?
- Q4.** What effect, if any, does the presence or absence of school-wide Title I status (40% or more of its students come from families who qualify as low income under U.S. Census definitions) have on the comparison among schools with different classroom organizational models (self-contained or departmentalized) for effects on fourth-grade general education students’ pass rates on (a) the 2009–2010 Virginia Standards of Learning reading and (b) the 2009–2010 Virginia Standards of Learning math?

## **Descriptive Analysis**

The obtained sample consists of 134 elementary schools of the 212 schools contacted, attaining roughly a 63% response rate. Of these schools, 94 involved either the self-contained or departmentalized classroom organizational model. The other 40 schools involved a combination of these two models, which prevented the differentiation of the effects of each model. Consequently, these 40 schools were excluded from the sample.

The distributions and descriptive statistics of the 94 schools retained in the sample are shown in Tables 1 and 2. Of the 94 schools, 53 (56.4%) used the self-contained model and 41 (43.6%) used the departmentalized model. Furthermore, 41 schools (43.6%) were under the Title I status; 53 (56.4%) were not (see Appendix C).

Table 1

*Frequency Distributions of Sample on Categorically Measured Characteristics of Interest*

Variable	Level	Frequency	% of total
Classroom model	Self-contained	53	56.4
	Departmentalized	41	43.6
	Total	94	100.0
School Title I status	Present	41	43.6
	Not Present	53	56.4
	Total	94	100.0

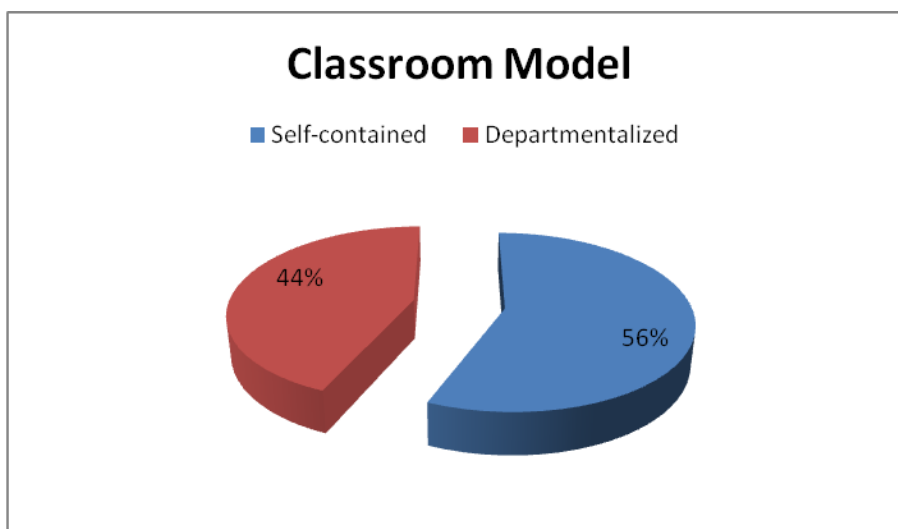
Table 2

*Descriptive Statistics for Sample on Continuously Measured Variables of Interest*

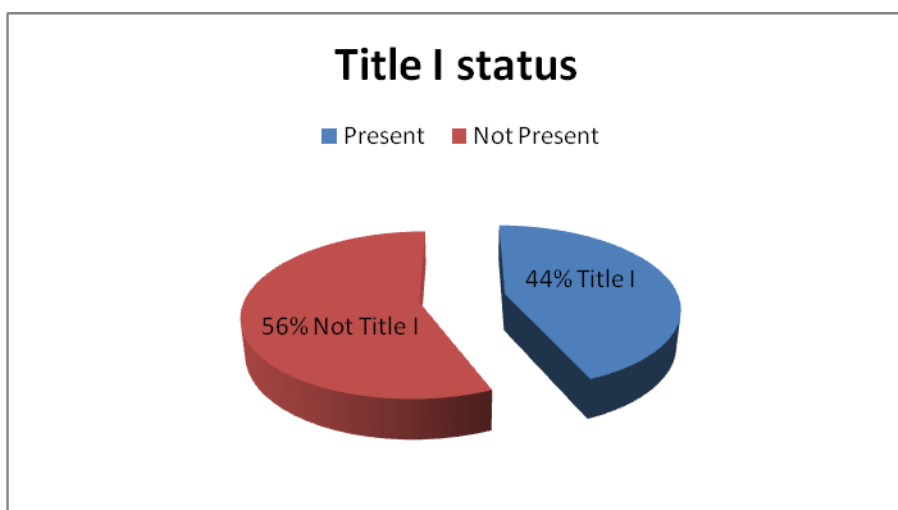
Variable	<i>N</i>	Minimum	Maximum	<i>M</i>	<i>SD</i>
VSL fourth-grade math pass rate	93	70	100	89.73	6.397
VSL fourth-grade reading pass rate	94	62	98	87.47	7.656
School size	94	184	980	530.46	146.814

*Note.* VSL = Virginia Standards of Learning.

Pass rates of fourth-grade students were also gathered; collectively those students had an average pass rate of 89.73 for math and 87.47 for reading. Graphical representation of the descriptive data is shown in Figures 2 through 7.



*Figure 2.* Classroom model distribution among 94 schools surveyed.



*Figure 3.* Distribution of school Title I status of 94 schools surveyed.

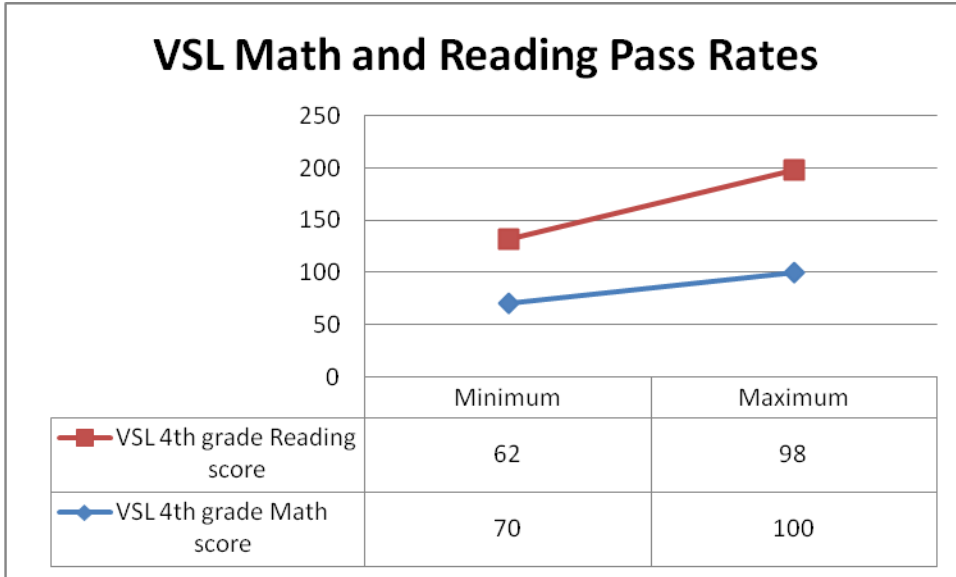


Figure 4. Minimum and maximum VSL math pass rates by school size.

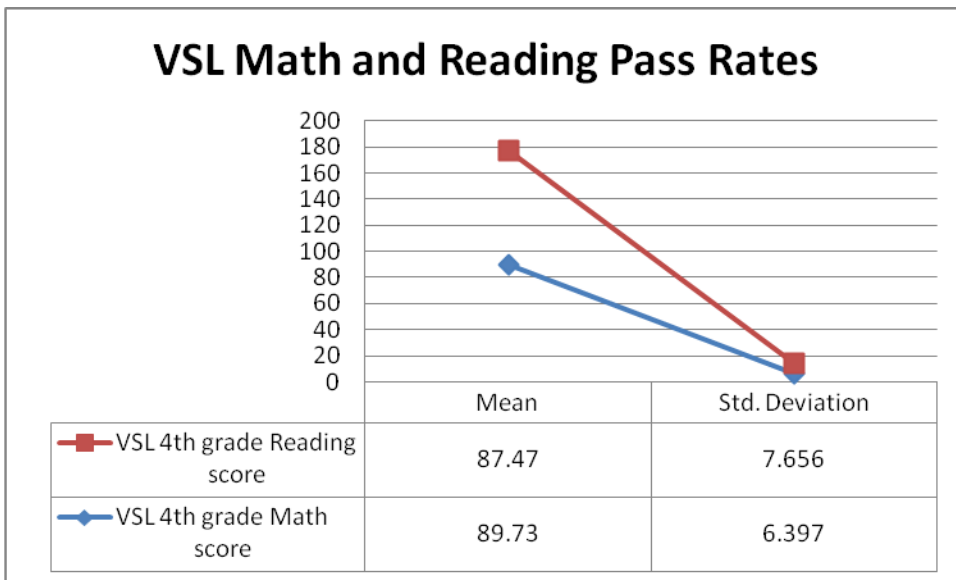
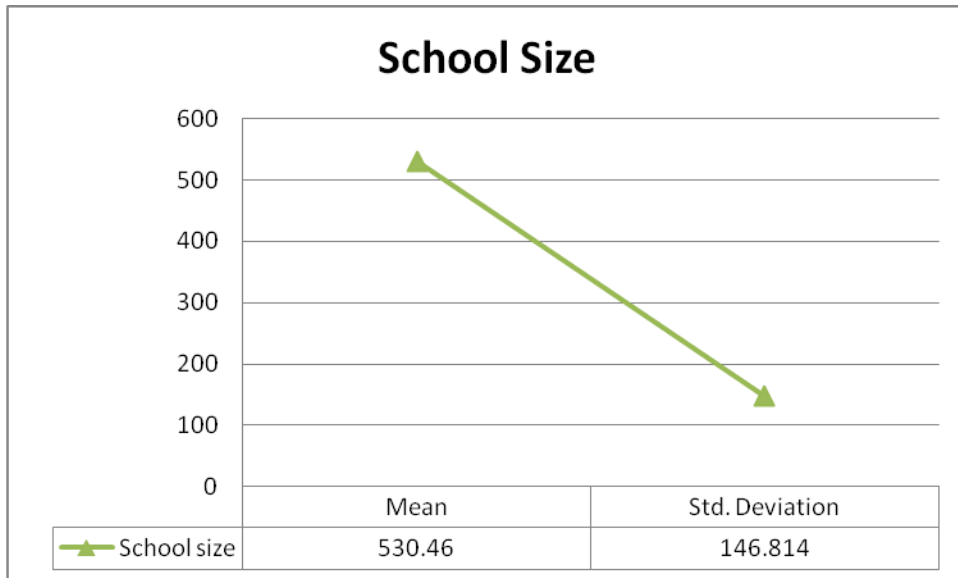
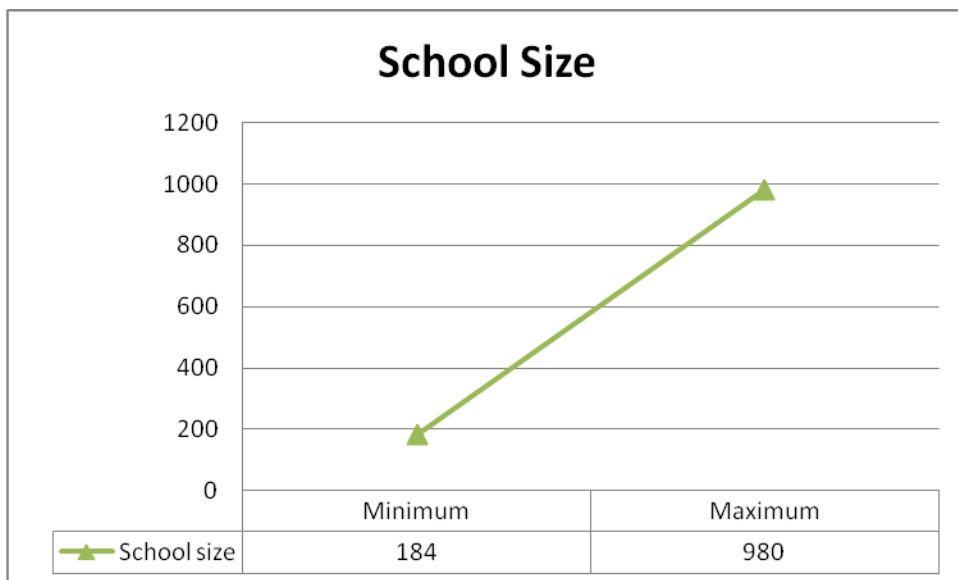


Figure 5. Mean and standard deviation of VSL reading pass rates



*Figure 6. Mean and standard deviation of School Size*



*Figure 7. Minimum and maximum by school size.*

### Statistical Analysis

The four research questions were addressed by conducting two ANOVA analyses, one for the reading VSL pass rate and one for the math VSL pass rate. These analyses

were two-between (classroom model and Title I status) ANOVAs with school size as the covariate. The primary assumptions of ANOVA are the (a) absence of outliers, (b) homogeneity of error variance of the dependent variables across the categories of each independent variable, and (c) distributional normality within each category of the independent variables.

ANOVA's were used because the objective was to determine whether a statistically significant difference existed between two independent populations regarding their reading and math VSL pass rates. The two independent populations in this study were the departmentalized and self-contained groups, and the dependent variables were the reading and math VSL pass rates. The ANOVA comparison was used on the reading and math VSL pass rates received from student records of the specific 2009–2010 school year for each of the departmentalized and self-contained groups. The test results were based on an  $F$  statistic that was distributed on an  $F$  distribution. This means that if a significant difference existed between the organizational models then the test statistic would exceed a critical value from the  $F$  distribution, which is 0.05. The sign of the test statistic (positive or negative) would indicate whether the departmentalized group or the self-contained group had a tendency to score higher or lower on the reading and math VSL pass rates.

The data were initially examined for outliers using the criterion of 1.5 interquartile range increments above and below the 75th and 25th percentile values, respectively, as the boundaries for outliers. This resulted in the identification of two outliers in the Title I subgroups for the VSL math pass rate and four outliers in the Title I

subgroups for the VSL reading pass rate. These six outliers were excluded from the sample.

The homogeneity of variance assumption was checked by performing Levene's tests on each of the dependent variables in the reduced sample. Levene's test is used to assess variance homogeneity, which is a precondition for parametric tests such as the  $t$  test and ANOVA. The test can be used with two or more samples. With two samples, Levene's test provides the test of variance homogeneity for the  $t$  test. With more samples, it provides the test for ANOVA, as in the case of the current study. If the significance from Levene's test is less than 0.05, the variances are significantly different and parametric tests cannot be used (and a nonparametric test would have to be used).

Levene's test works by testing that the variances of the group are the same. The output probability is the probability that at least one of the samples in the test has a significantly different variance. If this probability is greater than a selected percentage (usually 5%), it is considered too great to be able to usefully apply parametric tests. The results of the Levene's tests are shown in Table 3.

Table 3

*Results of Levene's Tests of Homogeneity of Variance for Each Dependent Variable*

Dependent Variable	$F$	$df1$	$df2$	Sig. ( $p$ )
VSL reading	3.757	3	84	.014
VSL math	1.980	3	84	.123

*Note.* VSL = Virginia Standards of Learning.

The results in Table 3 show that the null hypotheses that error variances of the dependent variables were equal across groups must be rejected in the case of the VSL reading pass rate. The corrections for this problem were readily available for a one-way ANOVA, whereas the present study's analyses consisted of two-way ANOVAs with a covariate. ANOVA is generally acknowledged robust to violations of the homogeneity of variance assumption. The effect of such violations is to increase Type I error. The appropriate response in this case was to proceed with the planned analysis and to be extremely conservative in interpreting any borderline-significant  $p$  values involving the VSL reading variable.

Table 4 shows the results of the Shapiro-Wilk tests of the departures from distributional normality of each dependent variable. The Shapiro-Wilk is a test of the null hypothesis that a sample came from a normally distributed population. Alternatively, the test rejects the hypothesis of normality if the  $p$  value is less than or equal to 0.05. Failing the normality test means that the assumption can be stated with 95% confidence the data does not fit the normal distribution. Passing the normality test only means that no significant departure from normality was found.

Table 4

*Results of Tests of Distributional Normality of Dependent Variables Across the Categories of Each Independent Variable*

Dependent Variable	Independent Variable	Category	Shapiro-Wilk		
			Statistic	<i>df</i>	Sig. ( <i>p</i> )
VSL reading	Classroom model	Self-Contained	.948	49	.030
		Departmentalized	.930	39	.017*
	Title I	Not present	.956	38	.144
		Present	.966	50	.155
VSL math	Classroom model	Self-Contained	.955	49	.060
		Departmentalized	.943	39	.048*
	Title I	Not present	.972	38	.438
		Present	.962	50	.109

*Note.* VSL = Virginia Standards of Learning.

\*significant at alpha level of 0.05.

Although the results of the Shapiro-Wilk tests indicated significant departures from normality for two of the four independent variable categories for VSL reading, and departures from normality for one of the four independent variable categories for VSL math, the low *p* values reflect the statistic's excessive sensitivity to sample size. Given this characteristic of the statistic, combined with the ANOVA's well-documented robustness to violations of normality, an appropriate guide was the standard that adequate normality can be assumed for values of the statistic of .90 and higher. This standard was met for all of the independent variable categories and for both dependent variables.

The descriptive statistics for VSL reading for the categories of each independent variable are shown in Table 5. The results of the analysis specifying VSL reading as the dependent variable are reported in Table 6.

Table 5

*Descriptive Statistics for VSL Reading Pass Rates by Classroom Model and Title I Status*

Independent Variable	Category	<i>M</i>	<i>N</i>	<i>SD</i>
Classroom model	Self-Contained	88.02	50	6.258
	Departmentalized	88.75	40	6.755
	Total	88.34	90	6.457
Title I status	No	91.51	39	4.394
	Yes	85.92	51	6.761
	Total	88.34	90	6.457

*Note.* VSL = Virginia Standards of Learning.

Table 6

*ANOVA Results of VSL Reading Pass Rates by Classroom Model and Title I Status, with School Size Covariate*

Source	<i>df</i>	<i>F</i>	Sig.	Eta Squared
Classroom model	1	.518	.474	.005
Title I	1	18.530	<.001	.179
Classroom model × Title I	1	.024	.878	.0002
School size (covariate)		.092	.762	.001
Error	83	(34.257)		

*Note.* VSL = Virginia Standards of Learning. Value enclosed in parentheses represents mean square error.

The results in Table 6 indicate a negative answer to the first research question: No significant differences in VSL reading pass rate exist among schools with the two different classroom models. School size did not have a significant relationship with VSL reading pass rate. School size correlation with the VSL reading pass rate was only -.027, which was not significantly different from zero ( $p = .794$ ). Thus, from the findings it can be said that controlling for the size of the student population does not have an effect on the comparison among schools with different classroom organizational models for effects on fourth-grade general education students' pass rates on both VSL reading and math pass rates. The result pertinent to research question 4A was the interaction between classroom model and the Title I status of schools. This effect was non-significant, thereby providing a negative answer to this research question. Specifically, mean VSL

reading pass rate among schools with the two different classroom models did not differ according to the presence or absence of Title I status.

The next results are for the evaluations of the research questions pertinent to the VSL math pass rate. Table 7 shows the descriptive statistics for VSL math pass rate for the categories of each independent variable.

Table 7

*Descriptive Statistics for VSL Math Pass Rates by Classroom Model and Title I Status*

Independent Variable	Category	<i>M</i>	<i>N</i>	<i>SD</i>
Classroom model	Self-Contained	88.90	51	5.547
	Departmentalized	90.38	40	6.768
	Total	90.11	91	5.911
Title I status	No	92.23	40	4.509
	Yes	88.45	51	6.376
	Total	90.11	91	5.911

*Note.* VSL = Virginia Standards of Learning.

The results of the analysis specifying VSL math as the dependent variable are shown in Table 8. Table 8 indicates that no significant differences existed in VSL math pass rate among schools with the two different classroom models. As was the case with the VSL reading dependent variable, school size did not exhibit a significant effect on VSL math pass rate. Its correlation with the VSL math pass rate was only  $-.077$ , which was not significantly different from zero ( $p = .464$ ). The result pertinent to research question 4B is the interaction between classroom model and the Title I status of schools. This effect was not significant, thereby providing a negative answer to this research

question. Specifically, mean VSL math pass rate among schools with the two different classroom models did not differ according to the presence or absence of Title I status.

Table 8

*Results of Analysis of Variance of VSL Math Pass Rates by Classroom Model and Title I Status, with School Size as the Covariate*

Source	<i>df</i>	<i>F</i>	Sig.	Eta Squared
Classroom model	1	.163	.688	.002
Title I	1	12.696	.001	.131
Classroom model × Title I	1	1.050	.307	.011
School size (covariate)		2.674	.106	.028
Error	83	(28.851)		

*Note.* VSL = Virginia Standards of Learning. Value enclosed in parentheses represents mean square error.

Further analysis was conducted by rerunning the separate ANOVAs for schools using the alternative models. Tables 9 through 14 show the results of the separate ANOVA analyses. The separate analyses of the self-contained and departmentalized schools showed that for schools in both of these categories, the mean pass rates on both VSL reading and VSL math were significantly higher in schools that were not in the Title I category than for schools that were Title I.

Table 9

*Results of Analysis for Self-Contained Classroom Model—Descriptive*

Descriptive	Title I	<i>N</i>	<i>M</i>	<i>SD</i>
VSL reading no outliers	No	22	91.27	3.820
	Yes	28	85.46	6.658
	Total	50	88.02	6.258
VSL math no outliers	No	23	91.65	3.601
	Yes	28	88.46	6.455
	Total	51	89.90	5.547

*Note.* VSL = Virginia Standards of Learning.

Table 10

*Results of Analysis for Self-Contained Classroom Model—Test of Homogeneity*

Test of Homogeneity of Variances	Levene Statistic	<i>df1</i>	<i>df2</i>	Sig.
VSL reading no outliers	5.687	1	48	.021
VSL math no outliers	5.944	1	49	.018

*Note.* VSL = Virginia Standards of Learning.

Table 11

*Results of Analysis for Self-Contained Classroom Model—Test of Equality of Means*

Robust Tests of Equality of Means		Statistic	<i>df1</i>	<i>df2</i>	Sig.
VSL reading no outliers	Brown-Forsythe	15.019	1	44.350	< .001
VSL math no outliers	Brown-Forsythe	4.953	1	43.644	.031

*Note.* VSL = Virginia Standards of Learning.

Table 12

*Results of Analysis for Departmentalized Classroom Model—Descriptive*

Descriptive	Title I	<i>N</i>	<i>M</i>	<i>SD</i>
VSL reading no outliers	No	17	91.82	5.151
	Yes	23	86.48	6.993
	Total	40	88.75	6.755
VSL math no outliers	No	17	93.00	5.534
	Yes	23	88.43	6.423
	Total	40	90.38	6.408

*Note.* VSL = Virginia Standards of Learning.

Table 13

*Results of Analysis for Departmentalized Classroom Model—Test of Homogeneity*

Test of Homogeneity of Variance	Levene Statistic	<i>df1</i>	<i>df2</i>	Sig.
VSL reading no outliers	3.353	1	38	.075
VSL math no outliers	.829	1	38	.368

*Note.* VSL = Virginia Standards of Learning.

Table 14

*Results of Analysis for Departmentalized Classroom Model—ANOVA*

ANOVA		<i>F</i>	<i>Df</i>	Sig.
VSL reading no outliers between groups	Between Groups	7.074	1, 38	.011
VSL math no outliers between groups	Between Groups	5.539	1, 38	.024

*Note.* VSL = Virginia Standards of Learning.

## **Conclusion**

Data from 94 schools were included in the analysis. The findings of the descriptive and statistical analysis using Levene's test, Shapiro-Wilk test, and ANOVA were presented in this chapter. The results showed no evidence of a significant difference between the two classroom organization models on either of the test pass rates. For each research question, the null hypotheses were accepted and it was concluded that no significant differences existed in the reading and math 2009–2010 school year VSL pass rates of fourth-grade general education students in schools with different classroom organizational models (self-contained or departmentalized). Further interpretations and implications of the results are presented in Chapter 5.

## Chapter 5: Discussion and Recommendations

The purpose of the study was to identify the organizational model, either departmentalized or self-contained, that had higher outcomes in measures of students' academic performance on reading and mathematics VSL pass rates for fourth graders in Region II of Virginia. Archival data from the VDOE and from elementary schools throughout the Commonwealth of Virginia were gathered to explore what effect, if any, these two classroom models, school size, and school-wide Title I status had on the performance of fourth-grade students on the Virginia Standards of Learning (VSL) achievement tests in reading and mathematics. According to the results of the data analysis, no significant effect on the performance of fourth-grade students in reading and math pass rates was shown based on use of either instruction organizational model.

### Findings

**Finding 1.** There was no significant difference in the VSL reading pass rates between schools with the two different classroom models. Different classroom organizational models did not exhibit a significant effect on VSL reading pass rates. A significance value of  $p = .474$  was obtained, which is higher than the 0.05 level of significance.

**Finding 2.** There was no significant difference in the VSL mathematics pass rates between schools with the two different classroom models. School size did not exhibit a significant effect on VSL math pass rates. A significance value of  $p = .688$  was obtained, which is higher than the 0.05 level of significance.

**Finding 3.** Controlling for school size did not have an effect on the comparison among schools with different classroom models (self-contained or departmentalized) on

fourth-grade general education students' pass rates on the 2009–2010 school year Virginia Standards of Learning reading and math pass rates.

**Finding 4.** Controlling for school size did not have an effect on the comparison among schools with different classroom organizational models.

For the third research question, the ANOVA results showed that the correlation obtained for the VSL reading pass rates was only  $-.027$ , which was not significantly different from zero ( $p = .794$ ). The ANOVA results showed that the correlation with the VSL math pass rates was only  $-.077$ , which was not significantly different from zero ( $p = .464$ ) either. A negative correlation means an opposite direction of movement for the two variables in concern. In this case, the negative correlation means that as school size increases, the student VSL reading and math pass rates decrease. From this, it was concluded that controlling for school size did not have an effect on the comparison among schools with different classroom organizational models.

**Finding 5.** VSL math and reading pass rates among schools with the two different classroom models did not differ significantly to the presence or absence of Title I status. The ANOVA results showed that the mean VSL reading pass rates among schools with the two different classroom models did not differ significantly to the presence or absence of Title I status. The result was the same for the VSL math pass rates; thus, the conclusion was made that mean VSL math pass rates among schools with the two different classroom models did not differ significantly to the presence or absence of Title I status. Overall, the findings of the study show that regardless of whether departmentalized or self-contained models of instruction are used, student achievement

based on reading and math pass rates are not significantly affected. Although an effect could exist, based on this data the effect cannot be ascertained with confidence.

## **Discussion**

The current findings are parallel with those of Sauers and Walker (2004), who suggested that developments in technology and changing social dynamics had altered communication and learning models, thus challenging the continued relevance of traditional learning approaches. Their concern extended to both departmentalized and self-contained instruction models but was focused on students in a business communication course. They concluded that student achievement could be directly associated with the inclusion of interdisciplinary approaches or a hybridization of teaching strategies. They suggested that classroom delivery models were not the determinants of students' achievement, as was also shown by the current findings. Sauers and Walker used more mature students without basic education profiles of the study participants, thus it was difficult to determine whether these students' previous classroom delivery model experience affected their performances. Sauers and Walker are among researchers who have suggested that the developing trends in educational instruction are the rationale used to substantiate new policies, regulations, and principles for evaluating student achievement.

Although the assumption has been that self-contained classrooms are the preferred model when speaking about student achievement, the current study findings of no significant difference in student achievement are aligned with some existing research, at least regarding the effects of instruction models on students' performances in reading and mathematics (McGrath & Rust, 2002). Research on students who have recently

transitioned from a self-contained classroom structure into a departmentalized or instructional team approach showed that students perceived the “classrooms as having less autonomy, fewer opportunities for input, and fewer cooperative group interactions than found in their elementary classrooms” (Parker, 2009, p. 2). Use of transitional models in middle schools has been suggested as an aid to this student transition (Parker, 2009). McGrath and Rust (2002) determined that students who know their teachers are more comfortable in the learning environment, and thus they are more successful learners. These previous researchers suggested that self-contained classrooms are better for student achievement based on more potential instructional time (Chan et al., 2009), but the current study findings are in agreement with the following statement: “There were no significant differences in student achievement gain pass rates between departmentalized and self-contained classes” (Borst et al., 2010 p. 35). Although some researchers showed performance differences in some subject areas based on how the students were organized (McGrath & Rust, 2002), the instructional model did not affect other subjects. The current findings are aligned with this ambiguity.

Based upon the findings of the current study, despite the attention given by previous researchers to this topic, no one has shown with certainty that departmentalized instruction has a significant difference than self-contained instruction or vice versa. As previously mentioned, researchers have indicated the many pros and cons of departmentalized and self-contained classroom settings, debated in the current era of educational reform in the area of student achievement. Educators have explored alternatives to improve the way public schools are organized. Patterns of organization for elementary schools have undergone many and varied changes since colonial times.

Research has indicated that departmentalization is recommended and followed in the intermediate grades almost exclusively. The findings from this research were not conclusive answers as to whether a departmentalized pattern is more advantageous than a self-contained organizational structure. Some previous studies indicated higher achievement for students in departmentalized classrooms, although others with comparable designs showed higher pass rates for students in self-contained classrooms (Young, 2005). Many researchers have concluded that more studies are needed concerning the advantages or disadvantages of various organizational structures. In the case of the inconclusive evidence from the current study, a similar recommendation is warranted.

### **Scope, Limitations, and Delimitations**

The scope of the present study was limited to VDOE resources or the school division's Department of Accountability, along with current building administrators or school personnel. Data from the following school divisions were used in the study: (a) Accomack, (b) Chesapeake, (c) Franklin City, (d) Hampton, (e) Isle of Wight, (f) Newport News, (g) Norfolk, (h) Northampton, (i) Poquoson, (j) Portsmouth, (k) Southampton, (l) Suffolk, (m) Virginia Beach, (n) Williamsburg/James City, and (o) York (all Region II Virginia school divisions). The study may not be generalizable beyond the scope of these schools and the participants because the data collection was limited to surveying the selected participants from these schools. However, the findings can still be used to support existing knowledge in the field of education about instruction models. Limitations include the purposeful sampling strategy used to select the data.

Also, the limitations of teacher quality, years of experience, level of skill, and Title I school-wide percent differences.

### **Implications**

Although the findings of the study did not lead to statistically significant difference, decisions of school-based administrators, supervisors, superintendents, and directors can be aided by this additional empirical knowledge on choosing intervention and transition instruction models that work toward sustainability and acceleration of students' academic attainment in elementary schools.

According to Davis (2004), significant declines over the past few years in the academic achievement of elementary students have been noted, especially in the subjects of mathematics and reading. Across the United States, educators are concerned about the achievement of all elementary students. The need for identification of alterable variables is especially pronounced as it applies to all students (Parham & McDavis, 1987).

In recent years, elementary students in K–12 schools in the United States have been described as a population at risk (Smith, 2007). Educators and educational researchers have the important task of determining the possible causes of this decline in academic achievement among these students; one possible cause has been the form of instruction used in schools.

**Implication 1.** School administrators could choose either departmentalized or self-contained classroom instruction for the same benefits on students' academic development.

**Implication 2.** Subject matter content (what is taught), and the persistence of both students and teachers to learn, seem to be of greater importance than debating how that

content is taught. As shown by other researchers, however, and supported by the current study, more research is necessary on selecting the best ways of teaching students and ways of stimulating their brains within the 21st-century.

### **Recommendations**

From the current findings, it is recommended that schools adopt either departmentalized or self-contained classroom models in their pedagogical designs to increase student achievement. To strengthen the findings of this research, an additional recommendation is for teachers and principals increasingly to focus on the content of subjects being taught and on the personal traits and qualifications of teachers, rather than on the composition of the students in a classroom (Slavin, 2007).

For future research, a recommendation is to consider the effect of different demographic variables such as socioeconomic status, race and ethnicity, and family background as variables in any study of delivery models (Tabachnick & Fidell, 2001). The researcher, supports the recommendations of Tabachnick and Fidell, and data using students' grades and test pass rates from multiple years could expand the analysis and stability of findings related to student achievement.

The current study involved a smaller-than-intended sample size; if the study were to be replicated in the future; more participants (i.e., more children in one school, more schools) across the departmentalized and self-contained groups would likely improve the quality of the findings. Also, include other high performing countries organizational models as compared to the United States.

For further research, a larger sample that includes additional schools or counties with similar student demographics could be used. Also, the study could be replicated with

other intervention programs, such as special education, to see if different modes of instruction in specialized classrooms have any effect on math and reading VSL pass rates.

To further strengthen the findings of the research, it is recommended that all subjects or all major subjects that are deemed useful for students' future careers be included as test variables, rather than being limited to the two subject areas of math and reading. Inclusion of the effect of different demographic variables of students is recommended, to determine performance effects under the differentiated instruction according to factors such as socioeconomic status, ethnicity, and family background, among others.

### **Conclusion**

The purpose of the study was to identify the organizational model, either departmentalized or self-contained, that had a significant difference in measures of students' academic performance on reading and mathematics VSL pass rates for fourth graders in Region II of Virginia. Student achievement was measured through the use of Virginia VSL pass rates in math and reading for self-contained versus departmentalized organizational models. The study involved using a survey to determine the organizational model currently in place in the selected schools. Reading and math pass rates were gathered from the State Department VSL and were subjected to statistical analysis. The findings were that no significant differences in VSL reading and math pass rates exist among schools with the two different classroom models. Controlling for school size and the presence or absence of school disability status did not have an effect on the comparison related to fourth-grade general education students' pass rates on the 2009–2010 school year VSL reading and math pass rates.

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## Appendix A

### Survey Letter

Dear Principal,

Currently, I am a doctoral candidate attending Virginia Tech. My study is titled, “*The Organization of the Elementary Classroom Delivery Model and its Effect on Student Achievement.*” **In order to compile the information for my research, please complete the three questions below and email the form back to me.**

**My study will not identify any specific school districts or schools and I plan to examine the relationship between the classroom delivery model and publicly available VSL data.**

The most effective organizational structure of elementary schools is an issue that has been contested by educational specialists and administrators since the beginning of the twentieth century (McGrath & Rust, 2002).

The following terms have been defined to provide clarity of usage in the questions below.

**Self-contained Classroom:** The self-contained classroom is the unit or organization within the elementary school whereby one teacher conducts all or nearly all the instruction from the class throughout the school day with the exception of art, music, and physical education (Dictionary of Education, 1973).

**Departmentalized Classroom:** The departmentalized classroom is a method of grouping students whereby the teacher is permitted to specialize in the teaching of one or a few subjects. This organizational method allows the teacher to move from room to

room to teach the various classes or the pupils to move from room to room for their classes (Dictionary of Education, 1973).

Please answer the following questions and email your answers back to me. My email address is [frog609@cox.net](mailto:frog609@cox.net).

Thank you for your participation,

Dave Reitz

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1. Did your 4<sup>th</sup> grade regular education operate in the departmentalized or self-contained organizational model? or a combination of both or neither? **For the 2009/2010 School Year.** Place an X in the box

Departmentalized model	Self-Contained model	Combination model
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2. Was your school a Title I school in 2009-10? Yes or No

3. Was the decision to use the departmentalized or self-contained organizational model a site-based or a district directive? Place an X in the box

Site-based	District directive
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## Appendix B

### IRB Approval Letter



Office of Research Compliance  
 Institutional Review Board  
 2000 Kraft Drive, Suite 2000 (0497)  
 Blacksburg, Virginia 24060  
 540/231-4606 Fax 540/231-0959  
 e-mail irb@vt.edu  
 Website: www.irb.vt.edu

#### MEMORANDUM

**DATE:** January 31, 2011

**TO:** Carol Cash

**FROM:** Virginia Tech Institutional Review Board (FWA00000572, expires October 26, 2013)

**PROTOCOL TITLE:** The Organization of the Elementary Classroom Delivery Model and its Effect on Student Achievement

**IRB NUMBER:** 11-065

Effective January 31, 2011, the Virginia Tech IRB Administrator, Carmen T. Green, approved the new protocol for the above-mentioned research protocol.

This approval provides permission to begin the human subject activities outlined in the IRB-approved protocol and supporting documents.

Plans to deviate from the approved protocol and/or supporting documents must be submitted to the IRB as an amendment request and approved by the IRB prior to the implementation of any changes, regardless of how minor, except where necessary to eliminate apparent immediate hazards to the subjects. Report promptly to the IRB any injuries or other unanticipated or adverse events involving risks or harms to human research subjects or others.

All investigators (listed above) are required to comply with the researcher requirements outlined at <http://www.irb.vt.edu/pages/responsibilities.htm> (please review before the commencement of your research).

#### PROTOCOL INFORMATION:

Approved as: **Exempt, under 45 CFR 46.101(b) category(ies) 4**

Protocol Approval Date: **1/31/2011**

Protocol Expiration Date: **NA**

Continuing Review Due Date\*: **NA**

\*Date a Continuing Review application is due to the IRB office if human subject activities covered under this protocol, including data analysis, are to continue beyond the Protocol Expiration Date.

#### FEDERALLY FUNDED RESEARCH REQUIREMENTS:

Per federal regulations, 45 CFR 46.103(f), the IRB is required to compare all federally funded grant proposals / work statements to the IRB protocol(s) which cover the human research activities included in the proposal / work statement before funds are released. Note that this requirement does not apply to Exempt and Interim IRB protocols, or grants for which VT is not the primary awardee.

The table on the following page indicates whether grant proposals are related to this IRB protocol, and which of the listed proposals, if any, have been compared to this IRB protocol, if required.

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## Appendix C

## School Data Set

<b>Division</b>	<b>School</b>	<b>Fourth-Grade Math</b>	<b>Fourth-Grade Reading</b>	<b>Self-Contained Departmentalized Combination</b>
Accomack	Chincoteague Elementary	83	93	Departmentalized
Chesapeake	Butts Road Intermediate	94	96	Combined
Chesapeake	Camelot Elementary School	94	87	Self-Contained
Chesapeake	Carver Intermediate School	91	83	Combined
Chesapeake	Cedar Road Elementary	94	87	Combined
Chesapeake	Chittum Elementary School	99	96	Self-Contained
Chesapeake	Deep Creek Elementary	92	88	Self-Contained
Chesapeake	Great Bridge Intermediate	98	98	Self-Contained
Chesapeake	Hickory Elementary School	95	89	Self-Contained
Chesapeake	Southwestern Elementary	95	88	Departmentalized
Franklin	S. P. Morton Elementary	89	75	Departmentalized
Hampton	A. W. E. Bassette Elementary	84	73	Self-Contained
Hampton	Armstrong Elementary	92	92	Departmentalized
Hampton	Barron Elementary	89	84	Self-Contained
Hampton	Booker Elementary	92	94	Departmentalized
Hampton	Cesar Tarrant Elementary	92	88	Self-Contained
Hampton	Francis Asbury Elementary	95	90	Self-Contained
Hampton	Jane H. Bryan Elementary	84	72	Combined
Hampton	John B. Cary Elementary	91	85	Self-Contained
Hampton	Luther W. Machen Elementary	79	81	Departmentalized
Hampton	Merrimack Elementary	86	69	Departmentalized
Hampton	Paul Burbank Elementary	90	83	Self-Contained
Hampton	Tucker-Capps Elementary	75	94	Combined
Hampton	William Mason Cooper Elementary	85	74	Self-Contained
Isle of Wight	Westside Elementary	90	94	Self-Contained
Newport News	David A. Dutrow Elementary	91	92	Self-Contained
Newport News	R. O. Nelson Elementary	84	88	Self-Contained
Newport News	Riverside Elementary	94	94	Self-Contained
Norfolk	Bay View Elementary	91	90	Combined
Norfolk	Chesterfield Academy Elementary	82	81	Departmentalized
Norfolk	Coleman Place Elementary	79	85	Self-Contained
Norfolk	Dreamkeepers Academy	84	76	Departmentalized
Norfolk	Fairlawn Elementary	81	82	Combined
Norfolk	James Monroe Elementary	80	80	Self-Contained
Norfolk	Larchmont Elementary	91	97	Self-Contained
Norfolk	Larrymore Elementary	84	81	Combined
Norfolk	Norview Elementary	81	76	Departmentalized

Norfolk	Oakwood Elementary	95	91	Departmentalized
Norfolk	Ocean View Elementary	98	91	Self-Contained
Norfolk	Oceanair Elementary	94	81	Self-Contained
Norfolk	Sewells Point Elementary	95	88	Self-Contained
Norfolk	Sherwood Forest Elementary	84	79	Combined
Norfolk	Suburban Park Elementary	89	80	Self-Contained
Norfolk	Tarrallton Elementary	89	91	Self-Contained
Norfolk	Tidewater Park Elementary	70	64	Self-Contained
Norfolk	Willard Model Elementary	90	85	Self-Contained
Northampton	Kiptopeke Elementary	78	72	Self-Contained
Northampton	Occohannock Elementary	72	62	Self-Contained
Portsmouth	Churchland Academy Elementary	87	88	Departmentalized
Portsmouth	Churchland Primary & Intermediate	84	92	Departmentalized
Portsmouth	Douglass Park Elementary	79	83	Self-Contained
Portsmouth	James Hurst Elementary	87	86	Self-Contained
Portsmouth	John Tyler Elementary	91	86	Combined
Portsmouth	Park View Elementary	86	86	Self-Contained
Portsmouth	Victory Elementary	81	75	Combined
Portsmouth	Westhaven Elementary	89	89	Departmentalized
Posuoso	Poquoson Elementary	91	89	Self-Contained
South Hampton	Riverdale Elementary	85	82	Departmentalized
Suffolk	Elephant's Fork Elementary	79	85	Departmentalized
Suffolk	Hillpoint Elementary		77	Self-Contained
Suffolk	Mack Benn Jr. Elementary	84	83	Self-Contained
Suffolk	Mount Zion Elementary	90	78	Departmentalized
Suffolk	Oakland Elementary	90	76	Self-Contained
Suffolk	Robertson Elementary	91	85	Departmentalized
Suffolk	Southwestern Elementary	95	92	Self-Contained
Virginia Beach	Alanton Elementary	94	91	
Virginia Beach	Arrowhead Elementary	93	92	Self-Contained
Virginia Beach	Bayside Elementary	94	92	Departmentalized
Virginia Beach	Birdneck Elementary	78	78	Departmentalized
Virginia Beach	Brookwood Elementary	89	92	Combined
Virginia Beach	Centerville Elementary	91	97	Self-Contained
Virginia Beach	Christopher Farms Elementary	89	92	Combined
Virginia Beach	College Park Elementary	92	81	Self-Contained
Virginia Beach	Corporate Landing Elementary	99	85	Departmentalized
Virginia Beach	Creeds Elementary	98	100	Combined
Virginia Beach	Fairfield Elementary	92	92	Self-Contained
Virginia Beach	Glenwood Elementary	84	86	Combined
Virginia Beach	Green Run Elementary	88	95	Departmentalized
Virginia Beach	Hermitage Elementary	94	99	Combined
Virginia Beach	Holland Elementary	90	88	Self-Contained

Virginia Beach	Indian Lakes Elementary	94	89	Departmentalized
Virginia Beach	John B. Dey Elementary	99	97	Departmentalized
Virginia Beach	Kempsville Elementary	80	91	Departmentalized
Virginia Beach	Kempsville Meadows Elementary	82	90	Combined
Virginia Beach	King's Grant Elementary	88	93	Combined
Virginia Beach	Kingston Elementary	98	94	Combined
Virginia Beach	Landstown Elementary	87	93	Combined
Virginia Beach	Linkhorn Park Elementary	93	97	Combined
Virginia Beach	Luxford Elementary	83	92	Combined
Virginia Beach	Lynnhaven Elementary	90	87	Self-Contained
Virginia Beach	Malibu Elementary	89	91	Combined
Virginia Beach	New Castle Elementary	95	94	Combined
Virginia Beach	North Landing Elementary	97	93	Combined
Virginia Beach	Ocean Lakes Elementary	93	98	Departmentalized
Virginia Beach	Old Donation Center	100	100	Combined
Virginia Beach	Parkway Elementary	89	85	Departmentalized
Virginia Beach	Pembroke Elementary	97	97	Departmentalized
Virginia Beach	Pembroke Meadows Elementary	88	92	Self-Contained
Virginia Beach	Point O' View Elementary	96	91	Combined
Virginia Beach	Princess Anne Elementary	96	97	Departmentalized
Virginia Beach	Providence Elementary	88	88	Self-Contained
Virginia Beach	Red Mill Elementary	95	96	Departmentalized
Virginia Beach	Rosemont Elementary	94	94	Self-Contained
Virginia Beach	Rosemont Forest Elementary	96	92	Self-Contained
Virginia Beach	Salem Elementary	94	99	Combined
Virginia Beach	Seatack Elementary	81	79	Combined
Virginia Beach	Shelton Park Elementary	90	89	Self-Contained
Virginia Beach	Strawbridge Elementary	91	93	Self-Contained
Virginia Beach	Tallwood Elementary	91	91	Combined
Virginia Beach	Thalia Elementary	85	88	Combined
Virginia Beach	Thoroughgood Elementary	98	97	Combined
Virginia Beach	Three Oaks Elementary	92	89	Departmentalized
Virginia Beach	Trantwood Elementary	96	98	Departmentalized
Virginia Beach	W. T. Cooke Elementary	96	93	Departmentalized
Virginia Beach	White Oaks Elementary	89	89	Combined
Virginia Beach	Williams Elementary	86	82	Departmentalized
Virginia Beach	Windsor Oaks Elementary	87	88	Self-Contained
Virginia Beach	Windsor Woods Elementary	90	90	Departmentalized
Virginia Beach	Woodstock Elementary	96	93	Combined
Williamsburg and James City	D. J. Montague Elementary	89	95	Self-Contained
Williamsburg and James City	James River Elementary	91	96	Self-Contained
Williamsburg and James City	Matoaka Elementary	95	100	Combined

City				
Williamsburg and James City	Matthew Whaley Elementary	96	95	Departmentalized
Williamsburg and James City	Norge Elementary	93	93	Self-Contained
Williamsburg and James City	Rawls Byrd Elementary	91	96	Combined
Williamsburg and James City	Stonehouse Elementary	99	99	Combined
York	Bethel Manor Elementary	97	89	Departmentalized
York	Coventry Elementary	94	92	Combined
York	Dare Elementary	96	93	Combined
York	Seaford Elementary	97	94	Departmentalized
York	Tabb Elementary	100	96	Departmentalized
York	Waller Mill Elementary	100	95	Self-Contained
York	Yorktown Elementary	100	95	Departmentalized

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