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An Investigation of the Effects of Class Size on Student Achievement in Title I Elementary Schools: A Mixed Methods Study

Jennifer Murphy
Virginia Commonwealth University

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AN INVESTIGATION OF THE EFFECTS OF CLASS SIZE ON STUDENT
ACHIEVEMENT IN TITLE I ELEMENTARY SCHOOLS: A MIXED METHODS
STUDY

A dissertation submitted in partial fulfillment of the requirements for the degree of
Doctor of Philosophy at Virginia Commonwealth University.

By

Jennifer St.Germain Murphy,

Bachelor of Science, Virginia Commonwealth University, 2002

Master of Teaching, Virginia Commonwealth University, 2002

Dissertation Chair: Dr. R. Martin Reardon,
Assistant Professor, Educational Leadership

Virginia Commonwealth University
Richmond, Virginia
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ABSTRACT

This was a multi-faceted mixed methods study that investigated several aspects associated to class size and the perceived effects on student achievement in Title I elementary schools. The data collection in this study was conducted through two separate phases. The first qualitative phase was a case study that was comprised of teacher interviews and classroom observations. The case study took place at a Title I school in Central Virginia, chosen for its diverse representativeness of the student population. Classroom interactions were coded during five-minute segments in each full-day classroom observation, as well as field notes made for specific types of instructional methods being used within each Title I classroom: individualized instruction, small group instruction, connecting personally with students, and incorporating technology into daily instruction. While a majority of the interactions within each classroom were positive, patterns emerged within the negative interactions that occurred. Interview responses indicated that the perceived ideal class size for Title I schools is 12-18 students, as well as provided explanations behind the perceived effects of class size on student achievement.

Findings from the first phase were used to create a survey that was distributed during the second qualitative phase of this study. This survey was distributed to the larger Title I teacher population within the same school district to generalize the findings from the case study. Finally, systematic student assessment data was collected to compare the perceived effects of class size to the observed effects of class size on student achievement data. Although the findings from the student achievement data were inconclusive, there

were several factors associated to class size that are discussed to explain the observed

effects on student achievement data in the case study Title I school.

CHAPTER ONE: INTRODUCTION

The issue of class size has been a major debate in education for many years (Biddle & Berliner, 2002; Glass & Smith, 1979). The limits on class size are determined by local school districts. Within a single school district there can be several different populations of students that are serviced. There are schools that service economically advantaged student populations, as well as schools that service at-risk student populations. One of the issues with regard to class size is that the same number of students can be put in a classroom with a single teacher, regardless of which type of student population is being serviced. Class size may not be viewed as an issue with more economically advantaged student populations, as they are still able to flourish academically (American Educational Research Association, AERA, 2003). Conversely, schools that service at-risk students populations, such as Title I schools, view class size as being more problematic in terms of it creating potential adverse effects on student learning.

The U.S. Department of Education defines Title I schools as those schools in which children of poverty make up at least 35 percent of enrollment. At the federal level, the element used in defining poverty is the participation in free or reduced-price lunch. In a national assessment of the Title I program, schools with 50 percent or more students eligible for free or reduced-price lunch are considered to be of high-poverty (Stullich, Eisner, McCrary, & the Institute of Education Sciences (IES), 2007). These schools are

eligible to use federal Title I funds for schoolwide programs that serve all children in the school (United States Department of Education, USDOE, 2007). A Title I specialist with the Virginia Department of Education (VDOE), explained that in practice schools are characterized as Title I under several different provisos (V. Tate, personal communication, December 9, 2008). For example, schools with 35% or more of children of poverty may be considered for Title I services. At the other extreme, schools with 75% or more of children of poverty must be served with Title I services, unless such schools can prove through other criteria that they do not need Title I services. In reality, local school districts decide for themselves what percentage of students of poverty is used as the benchmark for characterizing a school as being Title I. Although poverty level is used to define Title I status, it is up to individual school districts to identify criteria for defining poverty. In addition, individual school districts choose for themselves how to allocate Title I funds. For this particular study, the school district of interest defines poverty based on the percentage of the student population receiving free or reduced-priced school lunches (V. Tate, personal communication, December 9, 2008).

There are several challenges that teachers address within Title I school classrooms, in addition to teaching the curriculum, due to the large population of these schools being comprised of low-income families. Donnelly (1987) reported that these challenges include a lack of educational support from home, which puts Title I school students at risk of failing or potentially dropping out of school. As a Title I teacher for many years, I have experienced various class sizes: smaller classes of 18 to 20 students, and larger classes of 25 to 30 students. In working with different class sizes, my

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experience has persuaded me that this issue could be one of the contributing factors in the level of student achievement among at-risk student populations.

Statement of Problem

Since Title I schools in Virginia have a high proportion of low-income families whose children have historically been at risk of failing academically (Donnelly, 1987; Stullich et al., 2007), those students have different academic needs than students in non-Title I areas. Title I students lack the background knowledge gained from life experiences that non-Title I students bring with them to the classroom. In addition, these at-risk students lack the support (defined as including the access to books, resources, technology, and the educational level and expectations of parents) at home needed to succeed in the classroom (Berliner, 2009; Donnelly, 1987; Yungmann, 1993). For example, Yungmann (1993) found that a majority of at-risk students' parents have more fiscal constraints and less quality time to spend with their children. Therefore, they cannot provide necessary experiences for school readiness. Consequently, large class sizes may have an effect on the level of rapport that can be established between the teacher and the students. It is more difficult to devote individual attention to each student in larger-sized classes. In addition, larger class sizes may have an effect on the methods of instruction the teacher attempts to utilize within the classroom. For example, ability grouping, cooperative learning groups, and the use of computers become greater challenges with large numbers of students in the classroom. Collectively, these issues related to class size may affect the level of student learning attained within Title I classrooms.

Rationale for Study

In the past, researchers have investigated the relationship between student achievement and class size in the population at large. With the new standards required of educators today under the *No Child Left Behind Act* of 2001 (NCLB, 2002), a quality classroom has been redefined. A quality classroom that serves the needs for some student populations is not necessarily the best solution for all student populations. Schools that serve low socioeconomic (and hence at-risk) student populations have different needs than those schools that serve non-Title I student populations. I want to study Title I teachers' perceptions of how class size affects student learning. In particular, I want to study how class size affects participants' pedagogical decisions and relationships with students. Title I teachers are the experienced in-the-field experts who deal with the ramifications of class sizes every day; they are the ones that see firsthand how class size potentially modulates the quality of educational experiences in a classroom.

By relating teachers' perceptions regarding class size at Title I schools to issues of classroom quality, this study may provide solid evidence indicating a need for policy changes to address the provision of the most effective and meaningful educational experiences for all students today and in the future.

Statement of Purpose

The ultimate purpose of this study is to provide insight into how class size affects student learning. Of the many facets of that insight, this study explores the perceptions of experienced teachers in Title I schools concerning class size and how it influences

student achievement. By focusing on this specific aspect of class size, the findings of this study have the potential to make a significant impact on the decisions of both policymakers and administrators regarding class size in Title I schools.

Literature Background

This section provides a brief overview of the extant research on topics related to this study. This research will be revisited more thoroughly in Chapter 2: Review of the Literature.

A recent study (Baker, Grant, & Morlock, 2008) showed that teacher-student relationships predict children's successful school adjustment and the achievement of elementary school-aged children. They found that students' having a relationship with a teacher based on warmth, and trust was associated with positive academic outcomes. In addition, the same positive outcomes were connected to entailing low degrees of conflict between student and teacher.

School Outcomes and Class Size

Many other studies have looked at the implications of class size for academic outcomes. A meta-analysis on early class size studies (Glass & Smith, 1979) showed mixed conclusions regarding the impact of class size on student achievement. However, Glass and Smith reported that several problems existed in the class size studies of the past. These problems included literature searches that were often overly selective, and studies that were typically narrative and discursive. These were compounded by the fact that previous authors seemed to make errors in aggregating quantitative findings. Glass and Smith's meta-analysis categorized the research on class size into four stages: the pre-

experimental era (1895-1920), the primitive experimental era (1920-1940), the large-group technology era (1950-1970), and the individualization era (1970-present). They suggest that at the start of each new stage, the sophistication of research methodology increased, and the effects of class size on student achievement were examined from different perspectives. Taking all findings of their meta-analysis into account, Glass and Smith concluded that earlier studies on class size showed that more was learned in smaller class sizes.

More recently, Slavin (1990) suggested that smaller classes have only moderately positive effects compared to larger class sizes. Even then, according to Slavin, these moderately positive effects were only seen in students that had experienced smaller class sizes for three or more consecutive years. In addition, Slavin argued, it would be more beneficial to hire additional teachers to provide one-to-one tutoring rather than to reduce class size, and the effects on student achievement would be just as great. However, Slavin also made the point that reduced class size had the potential to improve school tone and morale, and aid in teacher retention.

One of the most influential studies on class size was Tennessee's experiment called Student/Teacher Achievement Ratio (Project STAR), (Achilles, 2003; Biddle & Berliner, 2002; Boyd-Zaharias, 1999). Project STAR was a large-scale, randomized experiment that included 11,600 students, and 1,300 teachers in 76 schools and 42 districts (AERA, 2003). Project STAR provided some of the most substantial evidence to date that smaller class sizes yield better results in student achievement in all subject areas, as well as in classroom behaviors (AERA; Boyd-Zaharias). Students who were

placed in a smaller–sized class performed better in terms of achievement. Longitudinal studies spawned from the original Project STAR experiment have followed the same students as they moved into regular sized classrooms, as well as on to high school (Achilles; AERA; Biddle & Berliner; Boyd-Zaharias; Januszka, 2008). Findings from these studies indicated that students who experienced smaller class sizes earlier on in their elementary education continued to exhibit higher school achievement levels through high school and had higher graduation rates (Boyd-Zaharias).

One limitation from the STAR project was the representativeness of the student population. It did not quite match the U.S. population in that very few Hispanic, Native American, and immigrant families were living in Tennessee in the middle-1980s (Biddle & Berliner, 2002). However, it laid the groundwork for studies that followed. According to Biddle and Berliner, Wisconsin's Student Achievement Guarantee in Education (SAGE) was one such study that stemmed from the results of Project STAR. SAGE confirmed the results of Project STAR, only this time the sample was more representative of the U.S. population in that a majority of the sample consisted of low-income and minority students (AERA, 2003). AERA reported that the SAGE experiment showed that the positive impact of smaller class size is greater for low-income students.

More recently, in a review of research on the relationship between class size and student engagement, Finn, Pannozzo, and Achilles (2003) looked at how small class sizes in the elementary grades have been associated with increased academic performance. They saw a consistent, integrated explanation of "why" small classes have positive effects. In observing classes in which class sizes were reduced, major changes occurred

in students' engagement in the classroom. Engagement was comprised of "learning behavior" and a continuum of prosocial and antisocial behavior. Both were highly related to academic performance.

Nationwide Research

The United States Department of Education (USDOE, 1999) conducted its own research into the positive and negative aspects of class size. They also looked at smaller class size in terms of financial obligations, and the implications of reducing class size for states' budgets in education. The USDOE report addressed whether it would be financially sound to promote smaller class sizes. Class size reduction was found to represent a considerable commitment of funds, and created a potential sizeable impact on the availability of qualified teachers. The report suggested that setting small class sizes for only targeted student populations could be one option that would limit the amount of funds needed. Although the report did not give a definitive solution on how to fund a nationwide class reduction initiative, it concluded that reducing class size to below 20 students would lead to higher student achievement.

Effectiveness of School Programs

In addition to the impact of class size, the effectiveness of different school programs has been researched. Ceperley (1999) presented a report on the effectiveness of Title I programs in four Virginia districts. In the report, Ceperley compared student achievement levels at two more-effective and two less-effective rural elementary schools. One of the characteristics used to compare the four schools was class size. School climate, culture, and school leadership were also compared. Here again, class size was

the chief factor among those studied that was associated with better student achievement levels at the more-effective schools.

Effective Instructional Methods

In looking at the effectiveness of Title I schools, certain instructional methods were found to work best with at-risk student populations. Barr and Parrett (2008) provided fifty strategies that work with underachieving and at-risk students. These fifty strategies were derived from a comprehensive effort to collect, analyze, and summarize research-based strategies for which there was evidence of effectiveness in educating low-performing students (Barr & Parrett). They agreed with Baker et al. (2008) and Finn et al. (2003) in identifying a strong relationship between teacher and student as a factor in decreasing behavior problems in the classroom, thus increasing time for instruction.

Connecting culturally. Barr and Parrett (2008) also suggested connecting culturally with the students in order attain effective teaching and learning. This means relating effective practices to the social, cultural, and historical characteristics and backgrounds of students and eliminating school and classroom practices that actually place the culturally diverse student at risk.

Individualized instruction. Individualized instruction was another strategy that was found to be successful in teaching at-risk students (Barr & Parrett, 2008). Barr and Parrett suggested that personalizing and individualizing instruction addresses the particular deficiencies of every student. Computer-assisted instructional programs used as teaching tools for students were found to be a successful method of individualizing instruction for at-risk students. A growing number of interactive computer-assisted

instructional programs have proven to be unusually effective in this effort (Barr &

Parrett; Macaruso, Hook, & McCabe, 2006).

All of Barr and Parrett's (2008) strategies are successful with at-risk student

populations, but they require a great amount of the classroom teacher's time. These

strategies address on an individual basis the benefits for smaller class sizes of at-risk

student populations mentioned above.

Counter Arguments

Kahlenberg (2000) argued the counterpoint on the class size issue in regards to at-

risk student populations. Kahlenberg reported that Title I schools are inefficient in

meeting student needs, regardless of class size. In addition, he suggested that no school

should have more than 50 percent low-income students. Rather, there should be

economic school integration through controlled public school choice intended to create

middle-class schools with student populations distributed equally across different

economic groups. These middle-class schools were viewed as to producing more

beneficial educational experiences. Kahlenberg's argument was that class size was not

the issue; rather it was the make-up of the student population that made a difference. In

contrast, studies such as STAR and SAGE clearly show that class size is the crucial issue

that affects student learning for elementary school aged children (AERA, 2003; Boyd-

Zaharias, 1999; USDOE, 1999).

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Implications of This Study

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Dating back to 1920, there has been a profusion of research conducted on the

effects of class size (Biddle & Berliner, 2002; Glass & Smith, 1979). In addition, there

have been several studies dedicated to at-risk student populations. However, there is little research on the effect of class size with elementary students specifically in Title I schools. This study will investigate the effects of class size on student learning at Title I schools. In doing so, I will examine how class size affects teacher student relationships. In addition, I will explore how class size may affect the pedagogical decisions made by teachers in Title I classrooms, ultimately affecting student learning.

Research Questions

The following research questions will be investigated as they relate to class size and student learning at Title I schools:

What aspects associated with class size identified by teachers (extracted from open-ended discussions with teachers in Title I schools) either enhance or detract from:

(1) the pedagogical decision-making processes that go into daily learning?

(2) the management of the classroom?

(3) the climate of the classroom?

(4) the interactions between teachers and students?

Methodology

A mixed-methods design was used to collect data for this study. The collection of data occurred in two phases. The first qualitative phase was comprised of a case study at a Title I school in Central Virginia. During the case study participating Title I teachers partook in two separate interviews and a full-day classroom observation. The purpose of the first interview was to review instructional practices and goals for each participating teacher as preparation for the classroom observation that followed the next day. The

purpose of the classroom observation was to explore what type of interactions take place in a Title I classroom, as well as make note of what instructional methods and practices were being used. Finally, the second interview was conducted to explore teacher perceptions regarding the effects of class size on the several aspects of the Title I classroom.

The findings from the first phase were then used to create a survey that was distributed to the larger Title I population of the same school district during the second quantitative phase of this study in an effort to generalize the findings from the case study. In addition, systematic student achievement data was collected for Grade 3 and Grade 5 of the case study school to compare perceived class size effects to the observed class size effects on student achievement data.

Findings and Conclusions

Through the classroom observations and teacher interviews, it was found that the interactions within the classroom drive both the classroom management and classroom climate. Additionally, this relationship also affects the pedagogical decisions made within the Title I classroom. However, it was observed that the most beneficial instructional methods were being used within each classroom. Findings from both the case study and the survey conclude that the perceived ideal class size for Title I students is between 12 to 18 students. Additionally, class size was consistently perceived to be the driving force behind all aspects within the Title I classroom. Finally, the findings from the student achievement data were inconclusive in portraying effects from class size.

Summary

Although the student achievement data was inconclusive in showing any effects from class size, there were several nuances associated to class size that were present, and are discussed in the Findings and the Discussion chapters of this study. Furthermore, although the perceived effects of class size appeared to be quite different from the observed effects of class size on student achievement, the consistent perceptions of the participating teachers and survey respondents should not be taken lightly. Each offered insight into what instructional methods are being used within the Title I classroom, as well as a perception of how class size effects the efficiency of using such instructional methods. The findings from this study also provide several implications for further research in areas related to the topic of this study, as well as other dimensions within the realm of education.

Definitions

These terms are used consistently throughout this study:

At-risk students – are students who are not experiencing success in school and are potential dropouts. They are usually low academic achievers who exhibit low self-esteem. Disproportionate numbers of them are males and minorities, and generally are from low socioeconomic status families (Donnelly, 1987). These students may have parents with low educational backgrounds who may not have high educational expectations for their children (Yungmann, 1993). In addition these students have disciplinary and truancy problems, and exhibit impulsive behavior (Donnelly).

Class size – is the number of students in a classroom for which one teacher is held accountable for their learning. In keeping with the standards set in class size initiatives like Project STAR, a small class size would range from 15 to 18 students, and large class size would be 22 or more students (Achilles, 2003; AERA, 2003; Biddle & Berliner, 2002; Boyd-Zaharias, 1999). Many factors have been associated in the literature with class size. Among these are the impacts on: (a) classroom student engagement, (b) student achievement, (c) connections between teacher and students, (d) instructional methods, and (e) classroom effectiveness. In addition, other factors include an increase in: (a) time on task, (b) hands-on activities, (c) individual attention, (d) time for diagnosis, (e) social climate, (f) management, (g) classroom participation, (h) academics, (i) parent involvement, (j) early identification for special education needs, (k) morale, (j) space, (l) enrichment activities, and (m) group work (Achilles; AERA; Biddle & Berliner; Boyd-Zaharias; Ceperly, 1999; Finn, Pannozzo, & Achilles, 2003; and Glass & Smith, 1979). While respecting the results of the previous literature, this study highlights the immediacy of the situation by gleaning the factors nominated by participants as being relevant.

Classroom climate – the atmosphere of the classroom based on wide range of merging variables: (a) teacher concern, punitiveness, authoritarianism, favoritism, enthusiasm, and clarity; (b) student decision-making, peer attitudes, competitiveness, and satisfaction; (c) classroom physical appearance; and (d) instructional practices (Engstrom, 1981).

Classroom interactions – the reciprocal verbal exchanges between teacher and student and student and student within a classroom.

Classroom management – those managerial behaviors and methods used within the classroom related to the maintenance of on-task student behaviors and the reduction of off-task or disruptive student behaviors (Vasa, S. F., 1984).

Experienced teacher – A teacher with five or more years of teaching experience.

Inclusion – is the practice of placing students with disabilities in regular classrooms (Virginia Department of Education, 2008).

Instructional method – refers to a pedagogical decision made by the teacher concerning the most beneficial ways to engage students in learning.

Parental involvement – The participation of parents in regular, two-way, meaningful communication involving students' academic learning and other school activities. The concept includes ensuring that parents play an integral role in their child's learning, that parents are encouraged to be actively involved in their child's education at school, that parents are full partners in their child's education, and that parents are included, as appropriate, in decision-making and on advisory committees. Parental involvement is one of the components of NCLB (VDOE, 2008).

SOL – Standards of Learning for Virginia Public Schools describe the Commonwealth's expectations for student learning and achievement in grades K-12 in English, mathematics, science, history/social science, technology, the fine arts, foreign language, health and physical education and driver education (VDOE, 2008).

Student engagement – is a continuum of active student learning. "At the most engaged end of the continuum are students who are interested in doing well in school because they have a strong intrinsic motivation to achieve," (McMahon & Portelli, 2004, p.64). At the least engaged end of the continuum are students who are disconnected, passive and withdrawn from activities and participation within in the classroom (McMahon & Portelli).

Student learning – measurement of student achievement based on scores on the Virginia SOL assessments conducted at the end of the academic year.

Systematic assessment data – data provided by routine assessments of student learning throughout the school year. Virginia SOL assessments and quarterly student achievement assessments are the forms of systematic assessment data used in this study.

Title I – Federal-funding program designed to help low-income children who are behind academically or at risk of falling behind. Title I funding is based on the number of low-income children in a school, generally those eligible for free lunch or reduced-fee lunch programs (Virginia Department of Education, 2008).

CHAPTER TWO: REVIEW OF THE LITERATURE

This literature review is divided into four sections. The goal of the first three

sections is to explore each of the three areas of pre-existing research that pertain to this

study. The first section provides a brief summary of various studies and reports on class

size and class size reduction programs. It presents a background of research connected to

this study. Section two discusses the make up of Title I schools, and provides a summary

of various characteristics of at-risk student populations. The third section examines

different pedagogical decisions and methods used within the classroom, and how certain

methods better serve the learning of at-risk students. The final section provides a

synthesis of how these three areas are connected to this study. Figure 1 below depicts the

conceptual relationship among the four factors discussed among the four sections of this

chapter.
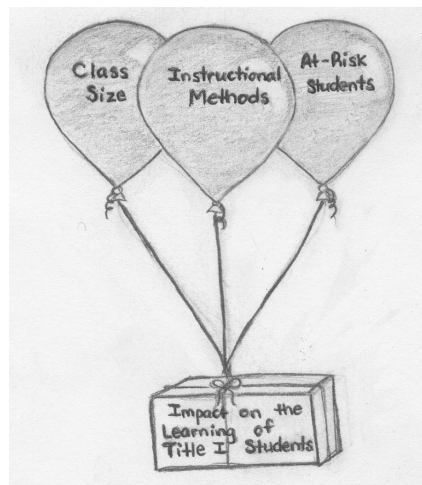
Figure 1. Pictorial Representation of how Class Size, characteristics of At-Risk Students,
and appropriate Instructional Methods support student learning in Title I classrooms.

Class Size Debate

Studies of the impact of class size on student achievement may be more plentiful than any other issue in education (Biddle & Berliner, 2002). However, experiments on class size by nature are nearly always done in field settings where uncontrolled events can undermine the research and affect results. A meta-analysis on early class size studies (Glass & Smith, 1979) showed mixed conclusions regarding the effects of class size on student achievement. However, Glass and Smith reported that several problems existed in the class size studies of the past. These problems included (a) literature searches that were often overly selective, (b) reviews were typically narrative and discursive, and (c) reviewers that attempted quantitative integration of findings made several mistakes.

The Glass and Smith (1979) meta-analysis categorized the research on class size into four stages: the pre-experimental era (1895-1920); the primitive experimental era (1920-1940); the large-group technology era (1950-1970); and the individualization era (1970-present). They reported that at the start of each new stage, the sophistication of research methodology increased, and the effects of class size on student achievement were examined from alternative perspectives. These differing perspectives were closely linked with events in the last century, such as the rising birth rate of the post-war 1940s, the advent of teaching technologies in the 1960s, and the teacher labor movements and declined enrollments in the 1970s. What was said about the class size data changed as new interpretations served emerging purposes (Glass & Smith).

In another meta-analysis on class size studies, agreeing with Glass and Smith, Biddle and Berliner (2002) reported that early experimental studies on class size started in the 1920s. However, they suggested, it was not until the late 1970s that more sophisticated research methods, such as meta-analyses, emerged. The more sophisticated meta-analytical methods facilitated the statistical aggregation of results from small-but-similar studies to estimate effects of class size for the studies' populations.

In comparing the results from early studies, the results of both Glass and Smith's (1979) and Biddle and Berliner's (2002) meta-analyses showed a consensus that short-term exposure to small classes generated gains in student achievement. These minor gains were greater in the early grades, in classrooms with fewer than 20 students, as well as for students from groups that are traditionally disadvantaged.

Other researchers, such as Slavin (1990), have suggested that smaller classes have only moderately positive effects over larger class sizes. Even then, according to Slavin, these moderately positive effects were only seen in students that experienced substantially smaller class sizes (e.g., a class reduction from 25 to 15 students) for three or more consecutive years. In addition, class size reductions from 30 students to 25 students did not have any meaningful effect on achievement. Slavin continued his argument by suggesting it would be more beneficial to hire additional teachers to provide one-to-one tutoring rather than to reduce class size, since the effects on student achievement would be just as great. However, Slavin also made the point that reduced class size had the potential to improve school tone and morale, and aid in teacher retention. Although Slavin suggested current research does not present a strong argument

for funding the reduction of class sizes, the point remains that smaller class sizes did produce positive effects over larger class sizes.

Fortunately, there have been a few well-designed studies that have investigated class size directly. These studies, such as Tennessee's Project STAR, have concluded that exposure to small classes in the early grades is associated with student achievement. Tennessee's Project STAR was the largest and best designed field experiment ever undertaken in education (Biddle & Berliner, 2002). The United States Department of Education (1999) considered it as "landmark" research.

Tennessee's Project STAR

The Project STAR experiment was a study designed by a group of researchers and members of the Tennessee Department of Education (Achilles, 2003; Boyd-Zaharias, 1999; Finn, 2002; Jacobs, 1987; Konstantopoulos, 2008; Nye, Hedges, & Konstantopoulos, 2002). The initial study took place from the fall of 1985 to the spring of 1989. As noted later, the results of the initial study gave rise to two follow-up studies and a policy application.

Project STAR invited all Tennessee schools with a large enough student body at the K-3 levels to form at least one of each of the three class types: small (thirteen to seventeen students), regular (twenty-two to twenty-six students), and regular-with-aide (twenty-two to twenty-six students). In the end, seventy-nine schools in forty-two districts provided a sample that consisted of more than 6,000 students per grade level (Achilles, 2003; Boyd-Zaharias, 1999; Jacobs, 1987; Konstantopoulos, 2008; Nye et al., 2002).

Schools were from all corners of the state of Tennessee, allowing for inner-city, rural, urban, and suburban locations to be included in the experiment. In the fall of 1985 6,328 kindergarten children and 329 kindergarten teachers were randomly assigned to one of the three class types. The children were to remain with their initial class assignment through the end of their third grade year, the 1988-1989 school year (Boyd-Zaharias, 1999). The random assignment of subjects was one of the strongest features of the Project STAR study, in that it would be impossible to assert that the researchers had placed all the smart children in a particular class type, and likewise for the stronger teachers. As required by the Tennessee legislature, no children in the Project STAR study were to receive fewer services than normal because of the experiment. Because the students participating would have normally been in class sizes ranging from twenty-two to twenty-six (possibly more) students, the study did not "harm" any children (Boyd-Zaharias; Jacobs, 1987).

In calculating results of this study, student achievement was to be tracked by standardized tests that were carefully monitored. As an additional safeguard, an outside consultant, (Finn), was contracted to perform all of the primary statistical analyses. Finn later went on to collect the data of the long-term effects of Project STAR's results (Boyd-Zaharias, 1999).

The results of Tennessee's Project STAR showed increased student achievement in several areas. Not only did students in small classes achieve at higher levels in reading than children in either of the other two class options, but they also improved in all subject areas tested (social studies, science, math reading, spelling, etc.). According to Achilles

(2003), increased student outcomes were experienced in four areas, known as the ABCDs: Academics, Behavior and discipline in classes and in school, Citizenship and participation both inside and outside of school, and Development into productive humane persons who were responsible for their actions.

Biddle and Berliner (2002) reported that Project STAR investigators found that the students in small classes were 0.5 months ahead of the other students academically by the end of Kindergarten, 1.9 months ahead at the end of first grade, 5.6 months ahead in second grade, and 7.1 months ahead by the end of third grade. Students who moved into the district after Project STAR had already started and were only exposed to the program for one, two, or three years had smaller, although still impressive achievement advantages over the other students.

In addition to the advantages in student achievement, Achilles (2003) reported additional benefits of Project STAR within the classroom. There were several observed in-class changes that occurred within the small classes. Among these changes were increases in: (a) time on task, (b) hands-on activities, (c) individual attention, (d) time for diagnosis, (e) social climate, (f) management, (g) classroom participation, (h) academics, (i) parent involvement, (j) early identification for special education needs, (k) morale, (l) space, (m) enrichment activities, and (n) group work. In addition, there were observed in-class decreases in indiscipline, retention, Special Education, and stress (Achilles).

Ultimately, the Tennessee class-size experiment actually gave rise to three separate studies: (1) Project STAR (1985-1989), the experiment in K-3, (2) Lasting Benefits Study (LBS 1989-1991), checking on the endurance of benefits achieved in

Project STAR, and (3) Project Challenge (1989-1993), a four-year study of class size implementation (Achilles, 2003). Figure 2 illustrates the timeframe of each of the Tennessee class-size studies.
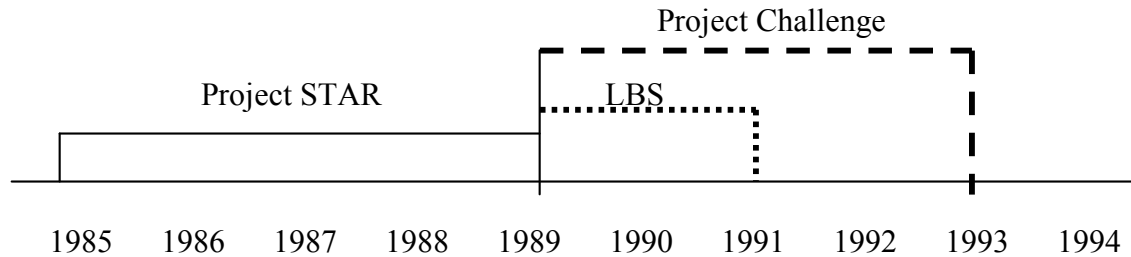
Figure 2. Timeline of events in the Tennessee class-size studies

Lasting Benefits Study. The Lasting Benefits Study (LBS) analyzed data from a sample of Project STAR pupils through grades 4 and 5, the first two years after the students returned to regular size classrooms. The results of LBS found that those students who were in Project STAR small classes were significantly ahead academically of the students who were in Project STAR regular and regular-with-aide classes. Achilles (1993) found that for at least the full two years after returning to regular sized classes, the former small-class students continued to perform better than their peers from regular and regular-with-aide classes on every achievement measure: Social Studies, Science, Mathematics, Reading, Spelling, and Writing.

Project Challenge. Project Challenge was also established subsequent to STAR's findings. It provided funds to the sixteen poorest counties in the state of Tennessee to reduce the class size from 25-30 students down to 15-22 students. This was not an experiment, but a policy application of the STAR findings, and it achieved noteworthy results. Achilles (1995) (one of the original STAR researchers) followed student

achievement in these counties using reading and math scores on the grade 2 Tennessee Comprehensive Assessment Program. Data for comparison were the average rank each year of the Challenge systems among the 138 Tennessee systems, so that the rank of 69 was average (with a ranking of 1 being the best and 138 the worst). Achilles found that on average, the Challenge systems that started the target class size of 15 students treatment in 1989 initially ranked well below the state average with a ranking of 98.9 in reading and 85.2 in math. However, by 1993 they ranked near or above the state average ranking of 78.5 in reading and 56.5 in math (Achilles, 1995; Boyd-Zaharias, 1999).

Further Data Analyses From Project STAR

The initial findings of Project STAR were so impressive that 1995 the Tennessee legislature authorized Health and Education Research Operative Services (HEROS) Inc. to conduct a third study to collect data on Project STAR students and measure student outcomes until those students reached the twelfth grade in 1997-1998 (Biddle & Berliner, 2002; Boyd-Zaharias, 1999), as seen in Figure 3.

With the funding from Tennessee legislators, the Tennessee Department of Education, and private foundations, HEROS Inc. was able to collect and run analyses pre-existing test data from grades 5 through 12 on Project STAR students and entered these into a master database. At the time HEROS Inc. started collecting this data, those students were in grade 10 of their high school career. The Project STAR students took the Comprehensive Tests of Basic Skills at the end of each year, and received scores in reading, mathematics, science, and social science. Finn, Gerber, and Boyd-Zaharias (2005) found the results from these tests showed that the average student who had

attended the small classes were months ahead of those students from the two standard

classes. In addition, those students who attended the small classes earned better grades

on average, and fewer dropped out or had to repeat a year. Once they reached high

school, more of the students from small classes opted to learn foreign languages, study

advanced-level courses, and take the ACT and SAT college entrance examinations. More

of them graduated from high school and were in the top 25 percent of their classes

(Biddle & Berliner). Finn et al. also found that attending small classes especially

increased the likelihood of graduating from high school among students eligible for free

lunch.
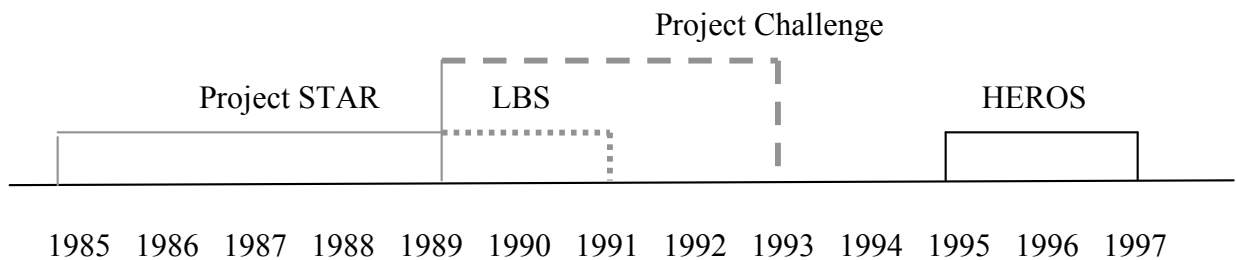
Figure 3. Timeline depicting data collection processes of Project STAR

As reported by Boyd-Zaharias (1999), Finn and Achilles conducted analyses of

the long-term effects of small classes in 1997, using the data from standardized test

scores for Project STAR students from grades 5 through 12. They found that in grades 4,

6, and 8, at which times all pupils had returned to regular-size classes, STAR students

who entered small classes in Kindergarten had better long-term outcomes that those who

began in first grade. The greatest statistical significance was found in those pupils who

attended small classes for four years from K through Grade 3. These results are

summarized in Figure 4.
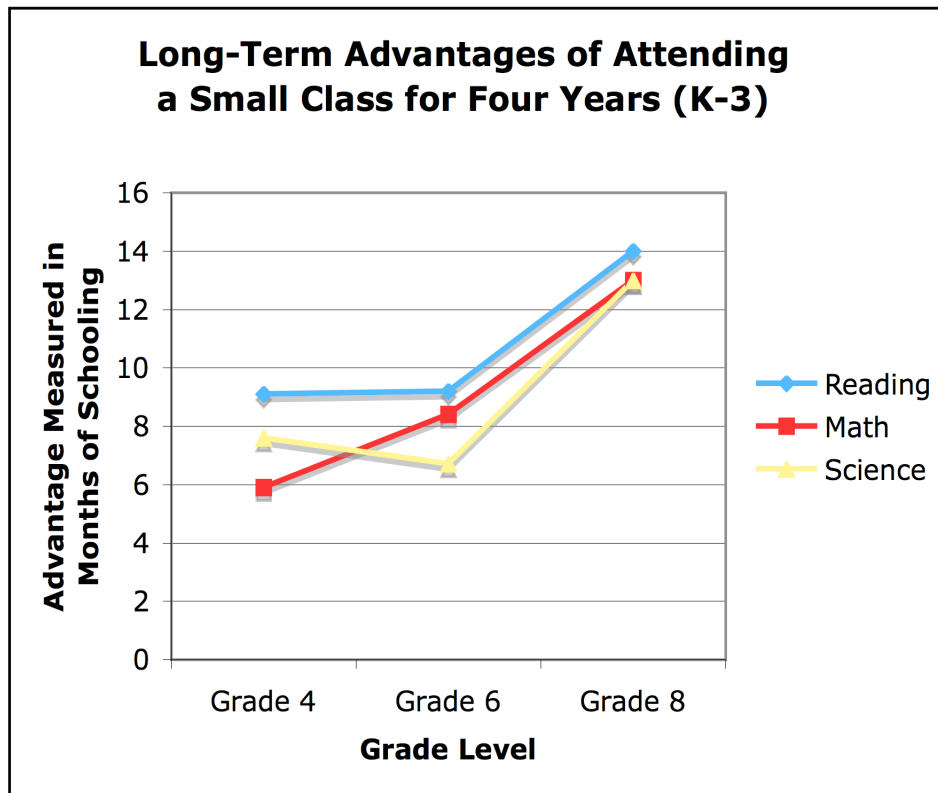
Figure 4. Line Graph illustrating the long-term advantages of attending a Small Class in Reading, Math and Science (Adapted from Boyd-Zaharias, 1999).

In addition, Nye, Hedges, and Konstantopoulos (2004) used data from a five-year follow up to Project STAR (1989-1994) to investigate whether differential effects of small classes on achievement for minority students persisted. A repeat measures analysis looking at Project STAR student test data from grades 4 through 8 showed that there was a statistically significant, positive differential lasting benefit of four years for minority students enrolled in small classes in reading. Nye et al. found that in the case of reading achievement, the small class effect for minorities was consistently much larger than for White students in all grades in the five years following the Project STAR experiment. The same repeated measure analysis suggested a negative differential lasting benefit for

girls enrolled in small classes in mathematics over five years following the Project STAR experiment. Thus, it appeared that the lasting benefits of four years of small classes reduced the racial and ethnic inequality in reading and gender inequality in mathematics (Nye et al., 2004).

One limitation to Project STAR. The impressive student academic outcomes from Project STAR were achieved with a cross-section of Tennessee students. One limitation from a national perspective of Project STAR was the representation of the student sample. Naturally, the population of Tennessee did not quite match the U.S. population in that very few Hispanic, Native American, and immigrant families were living in Tennessee in the middle-1980s (Biddle & Berliner, 2002). While Project STAR clearly applied to the target demographics in Tennessee at that time, in terms of generalizing to the U.S. population, it left something to be desired. Nevertheless, it laid the groundwork for studies that followed.

Student Achievement Guarantee in Education

Project STAR provided the foundation for several other class size reduction efforts in other states, such as Wisconsin and California (American Educational Research Association, AERA, 2003; Biddle & Berliner, 2002; Molnar, Smith, & Zahorik, 1999). Wisconsin's Student Achievement Guarantee in Education (SAGE) program was initiated in 1996, while HEROS Inc. was collecting follow-up data from Project STAR, as shown in Figure 5. Tennessee's Project STAR investigated schools in districts from all corners of the state and included varying student populations. However, when

reviewing the studies findings, the greatest increases in student achievement occurred where the average family income was low (Achilles, 2003;AERA; Boyd-Zaharias, 1999).

SAGE was a much larger project that focused specifically on the needs of disadvantaged students. SAGE was a five-year pilot project for K-3 classes in school districts where at least 50 percent of the students were living below the poverty level. Whole schools within target districts that volunteered to take part in the SAGE program were given an additional $2,000 for each low-income student enrolled in SAGE classrooms. The major intervention of the SAGE program was to reduce the average K-3 class size to 15 students for each teacher. The researchers compared student achievement scores from schools that incorporated the small class size with results from those schools in the same districts that maintained the standard class size having similar K-3 enrollments, racial compositions, average family incomes, and prior records of achievement in reading.

The results of the SAGE program were comparable to those from Project STAR. The students in the small class SAGE schools gained an additional 1.0 and 5.1 months of grade-equivalent advantages in achievement scores for reading, mathematics, science, and social science. The SAGE program, however, involved more Hispanic, Asian, and Native American students than Project STAR. The results of the SAGE program were so profound the Wisconsin legislature extended the SAGE program to other primary schools in the state. The once small trial project became a statewide program that is currently in place today (AERA, 2003; Biddle & Berliner, 2002; Wisconsin Department of Public Instruction, 2008).
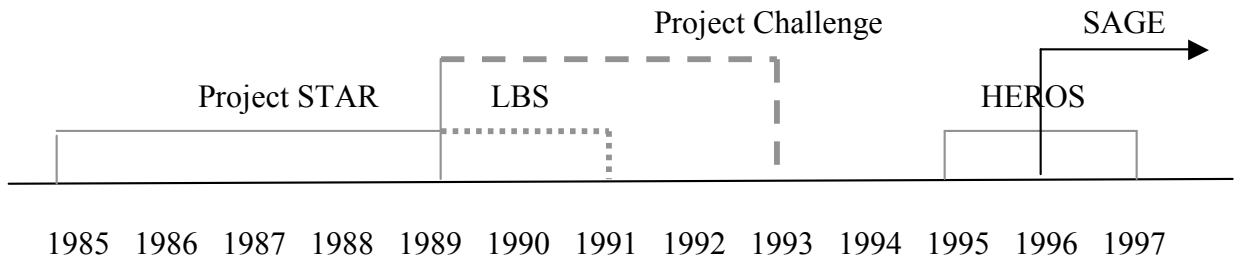
Figure 5. Timeline illustrating events of Project STAR and SAGE.

California Class Size Reduction Program

California also began a class size reduction program in 1996, as seen in Figure 6. However, it did not achieve results comparable to those achieved by either Project STAR or SAGE programs. There were several differences in California's program that have contributed to the slow gain in student achievement it has generated. One difference between SAGE and California's initiative was an economic factor. California granted an additional $800 for each student, where the SAGE program granted an additional $2,000 for each student. The poorer school districts that participated in California's program had to abolish other programs to afford hiring teachers for smaller classes (Biddle & Berliner, 2002).
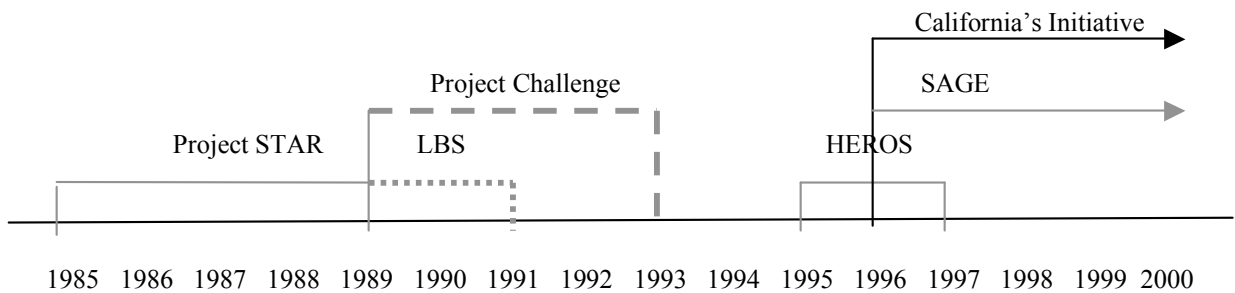
Figure 6. Timeline depicting class size reduction initiatives over the past two decades.

According to Biddle and Berliner (2002), abolishing and diverting resources from other programs led to further problems. Primary schools were already overcrowded, coping with 30-40 students in each classroom in the early grades, and there was a statewide shortage of certified teachers. Many schools had to hire teachers without certification or prior training. Moreover, in an effort to create the needed space to create smaller class sizes, other spaces for special education quarters, childcare centers, music and art rooms, computer laboratories, libraries, gymnasiums, and teacher lounges were "cannibalized"(Biddle & Berliner).

In addition to inadequate funding, California's definition of small class size was dramatically different from that used in Project STAR and SAGE. Where the small class sizes used in Project STAR and SAGE had only 15 students in each classroom, California reduced class sizes in the early grades from the statewide average of more than 28 students to not more than 20 students in each class. However, even this larger small class size was significantly smaller than what California schools had been coping with. Despite all of these differences, the California program has seen modest results when comparing measured student achievements between 3rd grade students that did and did not participate in the program (Biddle & Berliner, 2002). Biddle and Berliner argued that in many ways, the California initiative has proven a textbook case of how a state should not go about reducing class size. The failures in California's initiative lied within an inadequate definition of class size, insufficient funds, and ignored problems of overcrowding and teacher shortages (Biddle & Berliner).

Class Size and Student Behavior

In addition to student achievement, class size has also been found to affect student behavior. Through research review and analysis, Finn, Pannozzo, and Achilles (2003) found empirical evidence that student engagement increased when class size was reduced. Finn et al. found "teachers of small classes spend more time on instruction and less on classroom management or matters of discipline,"(p.322). When class sizes were reduced, students became more engaged academically, as well as socially. Academic engagement referred to student behaviors related directly to the learning process, such as: time on task, attentiveness, participation in learning activities, and taking initiative in the classroom (Finn et al.). The increase in engagement in the classroom is what led to an increase of learning in all subject areas.

Academic engagement and social engagement are the skills needed to learn in the classroom. According to Finn et al. (2003) students who are withdrawn or who engage in disruptive behavior in the elementary grades are associated with depressed academic performances. Moreover, when antisocial behavior disrupts the teacher or other students, learning is hindered for the whole class.

In reviewing the results of several studies of learning behavior that were conducted simultaneously with Project STAR, Finn et al. (2003) found a significant difference in percentage of students definitely on-task favoring small classes in reading but not in mathematics. One study was conducted during Year 3 of Project STAR, where trained observers observed a total of 52 Grade 2 classrooms in 13 schools during reading and mathematics lessons (Finn et al.). The observers recorded teacher-to-student and student-to-teacher contacts in behavioral, academic, or procedural contexts and took

descriptive notes to gather information in both small and regular classes. Finn et al. found that students were likely to get a turn more often during lessons, and students initiated more contacts with teachers in small classes. This supports the premise that class size affects student behavior.

National Reports on Class Size

The United States Department of Education (USDOE, 1999) released a report analyzing the pre-existing research on several class size reduction initiatives in the United States and what their results mean financially. The most significant and substantial data collected on class size and student achievement was found in the Project STAR and SAGE programs. The patterns of findings drawn from the existing research led to three conclusions in the USDOE report:

1. A consensus of research indicates that class size reduction in the early grades leads to higher student achievement. Researchers are more cautious about the question of the positive effects of class size reduction in 4th through 12th grades. The significant effects of class size reduction on student achievement appear when class size is reduced to a point somewhere between 15 and 20 students, and continue to increase as class size approaches the situation of a 1-to-1 tutorial.
2. The research data from the relevant studies indicate that if class size is reduced from substantially more than 20 students per class to below 20 students, the related increase in student achievement moves the average student from the 50th percentile up to somewhere above the 60th percentile. For disadvantaged and minority students the effects are somewhat larger.
3. Students, teachers, and parents all report positive effects from the impact of class size reductions on the quality of classroom activity. (p.8)

According to USDOE (1999), the question of class size is not simply a matter of less is more. Respected authorities in education finance, such as Odden (as cited in USDOE, 1999), were reported by the USDOE as arguing that a system-wide class reduction policy would produce only modest gains in student achievement while

incurring an unjustifiably high cost. Instead, Odden (1984, 2001, 2004, & 2007) has suggested certain targeted class reduction strategies in conjunction with a series of other interventions. Odden was reported as claiming that his proposals could produce greater benefits with lower costs.

The USDOE (1999) report concluded that reducing class size to below 20 students led to higher student achievement. Class size reduction represents a considerable commitment of funds, and its implementation can have a sizeable impact on the availability of qualified teachers. However, USDOE did not venture any suggestions about how that commitment of funds would be met.

Economic Benefits

The class size debate has spread internationally within the past decade. For example, in 1997, the Labour Party of the United Kingdom featured a commitment to reduce class sizes to 30 students or under for all 5, 6, and 7 year olds. As a result, the average size of primary classes taught by one teacher in primary schools in England decreased from 30 students to 26.7 students per classroom. This reduced class size initiative was carried on to secondary classrooms as well (Dustmann, Rajah, & van Soest, 2003).

Studies in England found that the reduced class size initiative as a whole has had economic effects as well. Dustmann, Rajah, and van Soest (2003) analyzed the effects of class size using the National Child Development Study (NCDS), which was a panel data survey based on a cohort of children born during one week in 1958. Looking at the data collected on that cohort of children, there were profound results regarding wages earned

later on in life based on the class size an individual experienced while in school. Those students who experienced smaller class sizes were more likely to make higher wages after completing their schooling (Dustmann et al.). Dustmann et al. found a significant negative effect of class size on the probability to stay at school at age 16, in that those students who experienced large class sizes were more likely to opt to discontinue their education at the age of 16. Students in England are given the choice of "staying on" in their education, enrolling in training programs, or joining the labour market at the age of 16 (Dustmann et al.).

In analyzing class size effects on wages, Dustmann et al. (2003) incorporated the staying on decision at age 16 as the mechanism through which class size affected education level and future wages. Reduced form wage equations, where the wage was directly regressed on class size, were used to analyze class size affects on earned wages. Ultimately, Dustmann et al. found that class size had a small secondary effect, rather than a primary effect on wages, in that class size impacted the students' decisions on school continuation. Students who had experienced smaller class sizes were more likely to decide to continue their education past the age of 16. Whereas an increase in class size reduced the probability of the students staying on, it also increased the probability of a student enrolling in training programs and joining the workforce.

Dustmann et al. (2003) also found that the school continuation decision was related to success on national exams. Again, class size affected the results on the national exams as well. Students of larger class size were more likely to score lower on the national exam, than those students of smaller class sizes (Dusmann et al.). Collectively,

this study found that smaller class size affected wages earned later on in life by influencing the individuals in those classes to continue with their education, thus scoring higher on the national exams. Those individuals who opted to continue school after age 16 earned higher wages than those who opted to leave school at the minimum age of 16 (Dustmann et al.).

Opposing Views

Some researchers, such as Hanushek (1999), have raised issues with the studies on class size. As reported by Biddle and Berliner (2002), Hanushek has been committed to the notion that public schools are altogether ineffective, regardless of class size. In addition public schools should be replaced by competing private schools.

Other researchers have pointed out the flaws in Hanushek's (1998, 1999, 2003) reviews that included many studies that used inappropriate samples or did not employ controls for school characteristics affects that might be confounded with those of class size. In fact, according to Berliner and Biddle (2002), most of the studies Hanushek reviewed did not look at class size at all but rather at student-teacher ratio (Biddle & Berliner, 2002). A class size of 15 students and one teacher would look the same as 30 students and two teachers in terms of ratios. However, the teacher with only 15 students in the classroom is only accountable for those 15 students. The two teachers in the classroom of 30 students are equally accountable for all 30 students.

A problem with past mandates for small class sizes, as seen with Hanushek's (1998, 1999, 2003) studies, arises from the use of pupil-teacher ratios for average class size rather than actual class size. A Pupil-Teacher Ratio (PTR) is defined as: the number

of students at a site (building, district, class) divided by: the number of teachers, educators, adults (etc.) serving the site. In contrast, the definition of Class Size (CS) is: the number of students in a teacher's room regularly, and for whom the teacher is accountable. A recent study (Achilles, 2003) has shown that in the United States the difference between class size and pupil-teacher ratio in elementary grades is about ten students. This means reports that conflate PTR for class size, where the PTR in a school building is 16:1, the average teacher will be accountable for 26 or more students each day. According to Achilles, it is impossible to do class size "research" by avoiding class size and substituting PTR numbers or outcomes for class size.

Class Size Summary

In summary, these studies have shown that for small class initiatives to work, there must be early intervention, starting in Kindergarten and that such intervention must continue for at least three, preferably four years. As seen in Project STAR and SAGE, a small class is defined as about 14-17 students per teacher. Both of those studies provided substantial evidence that smaller class sizes yield stronger results in terms of student achievement for minority and low socioeconomic students. Both of these sub-groups of student populations make up a large percentage of at-risk student populations. Title I schools largely serve at-risk student populations. Therefore, these characteristics represent the same needs as Title I student populations. Based on the results from Project STAR and SAGE, Tile I student populations could stand to benefit from smaller class sizes.

Title I Schools

The United States Department of Education (USDOE, 2007) defines Title I schools as those schools in which poor children make up at least 35 percent of enrollment. These schools are eligible to use federal Title I funds for schoolwide programs that serve all children in the school. Title I funds may also be used by schools that are not operating as schoolwide programs. However, schools that are not operating schoolwide programs must focus Title I services only on children who are failing, or most at risk of failing, to meet State academic standards. Title I reaches about 12.5 million students enrolled in both public and private schools. Title I funds may be used for children from preschool age to high school, but most of the students served (65%) are in grades 1 through 6. An additional 12% of the students are in preschool and kindergarten programs (USDOE).

A Title I specialist with the Virginia Department of Education (VDOE), explained that schools are characterized as Title I through several different caveats (V. Tate, personal communication, December 9, 2008). Generally, schools with 35 percent or more of children of poverty may be considered for Title I services. However, schools with 75 percent or more of children of poverty must be served with Title I services, unless they can prove through other criteria that they do not need Title I services. Overall, local school districts decide for themselves what percentage of student poverty is used as the benchmark for characterizing a school as being Title I. Although poverty level is used to define Title I status, it is up to individual school districts to identify criteria in characterizing poverty. In addition, individual school districts choose for themselves

how to allocate Title I funds. A local school district may receive an allocation of Title I funds. It is then up to the district to determine which schools get Title I funds and how much they get. For this particular study, the school district of interest defines poverty based on the percentage of the student population receiving free- or- reduced-priced school lunches (V. Tate, personal communication, December 9, 2008).

Characteristics of Title I Student Populations

By definition, schools participating in schoolwide Title I programs serve at-risk student populations as a whole. One report (Stullick, Eisner, McCrary, & Institute of Educational Sciences, 2007) found the school climate of Title I schools includes low-income students, racial/ethnic minorities, Limited English Proficiency (LEP) students, migrant students, and students with disabilities. Berliner (2009) recently reported that there are several out-of-school factors (OSFs) that play a powerful role in generating existing achievement gaps among these student groups. These OSFs include: (a) low birth-weight and non-genetic prenatal influences on children; (b) inadequate medical, dental, and vision care, often a result of inadequate or no medical insurance; (c) food insecurity; (d) environmental pollutants; (e) family relations and family stress; and (f) neighborhood characteristics. "These OSFs are related to a host of poverty-induced physical, sociological, and psychological problems that children often bring to school, ranging from neurological damage and attention disorders to excessive absenteeism, linguistic underdevelopment, and oppositional behavior," (Berliner, 2009, p.3). Thus, poverty limits student potential.

For Title I teachers, this means that there are several characteristics of at-risk students that challenge the teacher's duties beyond that of a regular classroom teacher. As defined by Donnelly (1987), at-risk students are those who are not experiencing success in schools and are potential dropouts. Generally they are from low socioeconomic status families. Parents of at-risk students may have low educational backgrounds and may not have high educational expectations for their children (Donnelly; Yungmann, 1993). At-risk students tend to have disciplinary and truancy problems, and exhibit impulsive behavior. Further, their peer relationships tend to be somewhat problematic. Challenges, such as family problems, drug addictions, pregnancies, and other problems commonly prevent them from participating successfully in school. In addition, they often experience failure and fall behind their peers, so that school becomes a negative environment that reinforces their low self-esteem (Donnelly, 1987). Even more problematic, those students who are both low income and minority status are at higher risk.

Title I Effectiveness

The state of Virginia characterizes schools as Title I based on the percent of the student population receiving free or reduced school lunches. In 1999 a report on the effectiveness of Title I programs in four Virginia districts was presented at the Annual Conference of the American Educational Research Association (Ceperley, 1999). It compared student achievement levels at two more-effective and two less-effective rural elementary schools. One of the characteristics used to compare the four schools was class size. However, a close inspection of class size indicated that it could not sufficiently

explain the differences in student achievement between the more-effective and less-effective schools. One factor that did explain the difference in effectiveness was strong leadership. The researchers found that the more-effective schools had principals who committed their attention to the quality of instruction, had high expectations in their teachers, and set out to hire the best teachers. The principals in both of the less-effective schools were new and had not yet asserted their leadership.

Ceperley (1999) reported another factor that contributed was a pervasive and broadly understood instructional focus. Teachers in the more-effective schools understood their students' disadvantaged backgrounds. However, they felt it was their job to overcome those disadvantages and talked about how important it was to use every minute of the day to make sure students had the opportunity to learn. Although there was no difference in teacher qualifications, the teachers in the less-effective schools were less confident in their abilities and expressed sympathy toward their students and students' families. On account of the students' backgrounds, teachers in the less-effective schools didn't want to put too much pressure on the students.

In terms of effectiveness of Title I schools, a 2000 study (Kahlenberg) reported that Title I schools altogether are inefficient in meeting student needs, regardless of class size. Kahlenberg suggested that no school should have more than 50 percent low-income students. Rather, there should be economic school integration through controlled public school choice as a means to create middle-class schools where student populations are distributed equally across different economic groups (Kahlenberg). Kahlenberg proposed that these middle-class schools would produce greater educational experiences.

Best Practices for At-Risk Student Populations

Building Relationships

Recent studies (Baker, Grant, & Morlock, 2008; Easton, 2008) showed that teacher-student relationships are what predict children's successful school adjustment and achievement. Baker, Grant, and Morlock evaluated the teacher-student relationship, specifically the degrees of closeness and conflict, in relation to American elementary schoolchildren and their teachers. Baker, Grant, & Morlock (2008) included 423 Kindergarten through fifth grade students from four elementary schools in the southeastern United States. The participating school district had a large population of at-risk students, with about 70% of the student body receiving free- or reduced-cost lunch. This study particularly looked at those students with significant externalizing (acting-out behaviors: aggression, hyperactivity, and conduct problems) or internalizing (anxiety, depression, and somatization) behavior problems. A total of 68 teachers in the schools participated in this study. Those teachers completed two standardized behavior rating scales, the *Behavior Assessment System for Children-Teacher Rating Scale for Children* (BASC TRS-C) and the *Teachable Pupil Survey* (as cited in Baker, Grant, & Morlock, 2008), for each participating child in their classroom (Baker et al.). Baker et al. used the School-Appropriate Behaviors subscale of the *Teachable Pupil Survey* to measure the degree to which children were adjusted to the norms, routines, and expectations of the classroom environment (Baker et al.).

Baker et al. (2008) found that teacher-student relationships characterized by trust and warmth were positively associated with school adaptation, while teacher-student

relationships dominated by conflict were negatively associated with school adaptation. This study found that having a relationship with a teacher based on warmth, trust, and low degrees of conflict was associated with positive school outcomes. For example, one significant interaction found in this study indicated that children who demonstrated externalizing behavior problems and a close relationship with their teacher had better achievement in reading than did similarly affected students with less warm relationships with teachers (Baker et al.).

Easton (2008) agreed with Baker et al. (2008) in that relationships build trust and learning. In addition, a sense of community is built through relationships within a classroom, which then creates a general feeling of support. Easton suggested that with trust and transparency in a relationship between student and teacher, both parties are receptive to reciprocal advice, feedback, and input. Thus, deep discussions and exchanges can take place more freely. Easton argued that building relationships is easier with smaller class sizes. She suggested there are several ways teachers can take advantage of smaller class sizes when teaching at-risk students: (a) Teach, rather than manage and discipline, (b) Provide clear and focused instruction, (c) Use a variety of teaching strategies to meet individual learning needs, (d) Monitor learners and reteach as necessary, (e) establish effective processes for whole group discussions, (f) engage in personal interactions and provide personal encouragement, (g) Use cooperative groups and learning centers, (h) Let students become more self-directed in terms of what they learn and how they demonstrate it, and (i) assign students more written work.

Barr and Parrett (2008) provided fifty strategies that work with underachieving and at-risk students. They agreed with Easton (2008), Baker, Grant, and Morlock (2008), and Finn, Pannozzo, and Achilles (2003) in identifying a strong relationship between teacher and student as a factor in decreasing behavior problems in the classroom, thus increasing time for instruction. Barr and Parrett mirrored Baker et al. and Easton, in that to be effective with at-risk students, teachers must form a connection with each student. In order to be effective in teaching at-risk students, the teacher has to first understand them (Barr & Parrett). Barr and Parrett also argued that teachers should personalize their classrooms and become student advocates. They suggested that something as small as greeting students at the door and welcoming them by name as they walk in the room can be all it takes to make a difference in a student's life. Barr and Parrett intimated that such recognition may be an infrequent occurrence for an at-risk student.

Connecting Culturally

Barr and Parrett (2008) also suggested connecting culturally with the students in order attain effective teaching and learning. This means relating effective practices to the social, cultural, and historical characteristics and backgrounds of students and eliminating school and classroom practices that actually place the culturally diverse student at risk. Dalton (2008) suggested that learning should be connected to the world of all students, especially at-risk students. Successful methods that reach the needs of at-risk students and culturally diverse students are: (a) cooperative learning, (b) instructional conversations, (c) talent development, (d) employing the concept of multiple

intelligences, (e) technology-enriched instruction, and (f) cognitive-guided instruction (Barr & Parrett, 2008; Dalton, 2008).

Small Group Instruction

According to Pellegrini and Blatchford (2000) and Akhavan (2008), small group instruction is another instructional method that enables students to interact with their peers and teachers. Akhavan supported small groups for guided reading instruction with Title I students. In addition, Akhavan argued that units of study should be incorporated in reading instruction in addition to small groups for Title I students. However, Pellegrini and Blatchford argued that there is a connection between class size and grouping practices in terms of number and size of groups. Pellegrini and Blatchford found that teachers felt that learning was more effective when group sizes were smaller. In addition, larger groups were harder to control, thus student learning was affected.

Individualized Instruction

Individualized instruction was another strategy that was found to be successful in teaching at-risk students (Barr & Parrett, 2008). Barr and Parrett suggested that personalizing and individualizing instruction addresses the particular deficiencies of every student. In individualized instruction, teachers acknowledge gender and racial differences and plan lessons that relate to the strengths of both boys and girls at their specific age levels. In their research analysis, Finn, Pannozzo, and Achilles (2003) found that teachers change their strategies when class sizes are reduced, generally providing more individualized instruction and higher quality instruction.

Computer-assisted instruction. Macaruso, Hook, & McCabe (2006) agreed with Barr and Parrett (2008) in suggesting that a successful method of individualizing instruction for at-risk students is using computer-assisted instructional programs as a teaching tool for these students. A growing number of interactive computer-assisted instructional programs have proven to be unusually effective in this effort (Barr & Parrett, 2008; Macaruso et al.). These strategies are successful with at-risk student populations, but they require a great amount of the classroom teacher's time. These strategies mirrored reasons cited for the benefits of smaller class sizes for at-risk student populations. For example, a recent study (Macaruso et al.) on a computer-based supplementary phonics program for advancing reading skills in at-risk elementary students found that first graders who participated in the program made significant reading gains over the control group children who received regular reading instruction. Ten first-grade classes were selected for participation in this experiment. These classes were located in five urban elementary schools in a greater Boston school district. One class in each school was assigned to the treatment group, while the second class was assigned to the control group. All treatment and control group classes were engaged in daily reading instruction using some form of explicit phonics instruction. According to Macaruso et al., the treatment classes used Lexia software for approximately six months for phonics instruction. Meanwhile, the control classes were receiving regular classroom instruction. The *Gates-MacGinitie Test, Level BR* (as cited in Macaruso, Hook, & McCabe, 2006) assessment was then used to assess reading performance. Results showed there was a significant difference favoring the treatment group of this study, indicating that the

computer-assisted phonics program not only fostered learning, but increased student achievement (Macaruso et al.).

Another recent study (Kemker, Barron, & Harmes, 2007) used a mixed methods approach to investigate the integration of laptop computers into an elementary classroom in a Title I status school. Through classroom observations, interviews with the teacher, interviews with the students, and an analysis of student projects, Kemker et al. examined the authentic learning relative to the student projects and activities. The laptop computers were initially incorporated into lessons with technology-enhanced projects, generally encompassing an hour or two each day. Throughout the study, students used tool-based software (such as word processors, spreadsheets, graphic organizers, and video editors) that provided the opportunity to construct their own knowledge and create a product (Kemker et al.). Results from this study showed that authentic tasks and technology are a feasible combination for at-risk students. Not only did the use of laptops create the opportunity for authentic assessments for student learning, it motivated Title I students to take responsibility in their own learning (Kemker et al.).

Content Specialists at the Elementary Level

Another best practice in providing the best instruction to at-risk student populations would be to departmentalize instruction at the elementary level, thus enabling teachers to become content specialists. A recent study (Gerretson, Bosnick, & Schofield, 2008) indicated that content-specific professional experiences afforded elementary teachers greater opportunities to focus on subject area content, pedagogical content, and instructional strategies at deeper levels, to become more confident and competent

teachers. Hence, enriching the instruction each student receives. In identifying factors associated with the growing use of teacher specialists in the elementary schools of a large metropolitan school district located in northeastern Florida, particularly in the area of mathematics, team teaching was reported to be most prevalent in the higher elementary grades, particularly Grade 3 through Grade 5. The majority of schools that incorporated team teaching defined it as two teachers teaching specific content subjects to the same two classes. Approximately 53% of the principals reported team teaching in Grade 3, with 75% and 78% reporting team teaching in Grade 4 and Grade 5, respectively. Approximately 88% of the survey respondents in that study reported that teachers became specialized in a particular subject area, which empowered them to provide more effective classroom instruction. Similar studies (Piechura-Couture, Tichenor, Touchton, Macisaac, & Heins, 2006) reported the same results, as well as an increase in student test scores with using team teaching at the elementary level.

Implications For This Study

There is an abundance of research relating to at-risk students and low-achieving students, as well as class size effects and class size reduction initiatives. In regards to the state of Virginia, the United States Department of Education (1999) reported that starting in 1995, Virginia began an effort to reduce class size in Kindergarten through 3rd-grade classes for at-risk students, using a strategy in which local systems that devote funds to the voluntary program may receive matching funds from the state. However, there is very little research dedicated to the specific population of Title I students.

One study that did meet those criteria, Success Starts Small, was a reduced-class initiative prompted by Project STAR that targeted two elementary schools in High Point, North Carolina from October 1993 to June 1994. This initiative compared the early elementary grades (K-2) in two Title I-eligible schools. One school used a traditional Title I pull-out model, and the other school used Title I resources to create small classes. In the traditional school average class sizes were 23 students, while the school that created small classes had 14 students in each class (Finn, Pannozzo, & Achilles, 2003).

One feature of this initiative was to monitor interactions between teachers and students. They were classified every 4-5 seconds of interactions into one of three categories: "personal" (not related to academic activities or school), "institutional" (related to daily classroom routines), or "task" (related to academic activities). Interactions were also coded as having an "individual" focus, "group" focus, or "mixed" focus. Observations were conducted in fall 1993 (pre) and May 1994 (post). The school implementing the small classes was found to have a consistently high percentage of task-related interactions, approximately 82% (pre) and 84% (post) of all interactions. The percentages of task-related interactions in the school implementing the traditional classes were 79% (pre) and 67% (post). In addition, the percentages of interactions focusing on individual students rather than groups were also different between the schools. The school implementing the small classes had pre and post percentages of 51% and 44%. The school implementing the traditional classes had the percentages of 31% (pre) and 33% (post). The interactions of teachers and students in small classes were more often related to academic or learning activities that were the interactions of teachers and

students in the traditional classes. These interactions allowed for more student engagement, therefore fostering positive student behavior (Finn, Pannozzo, Achilles, 2003). In this study, smaller class sizes allowed for more positive student engagement within the classroom. Such an environment should provide the opportunity for better learning to occur for Title I students. This study was a step in right direction in terms of measuring class size effects on classroom instruction for Title I students, in addition to student achievement.

As seen in the research evidence from Project STAR and SAGE, students in smaller classes with fewer than 18 students did better when compared with students in larger classes. Given the variations among individual students and teachers how they interact, it is unlikely that there is a single "magic number" below which class size suddenly produces a beneficial effect. However, the USDOE (1999) reported it is clear that class size must get somewhere below 20 in order to make a real difference. Particularly looking at the results from the SAGE study, smaller class sizes produced better student achievement results for children of poverty. This current study is an attempt to see if class sizes of Title I classrooms either enhance or detract from (a) the pedagogical decision-making processes that go into daily learning, (b) the management of the classroom, (c) the climate of the classroom, and (d) the interactions between teachers and students, as well as effects on Title I student learning.

CHAPTER THREE: METHODOLOGY

The purpose of this study was to investigate the effects of class size in Title I
schools. To investigate this issue, I made field observations and conducted qualitative
interviews with current experienced (5 years or more of teaching) Title I teachers. In
addition I looked at pre-existing data on past student achievement scores. This chapter
provides an outline for the procedures that were used in this study. There are five
sections in this chapter. In the first section, the design of the study is discussed in detail.
I discuss reasons for choosing such a design, its strengths and weaknesses. The next
section discusses the participants used in this study. This section also provides an
explanation on how the participants were chosen for this study. The next section
discusses the data sources for this study, followed by an in depth explanation of the
procedures used in this study. Finally, a section on conducted analyses is provided to
illustrate what analyses were used to answer each of the research questions.

There were four research questions that were investigated in this study:
What aspects associated with class size identified by teachers (extracted from open-ended
discussions with teachers in Title I schools) either enhance or detract from:

(1) the pedagogical decision-making processes that go into daily learning?

(2) the management of the classroom?

(3) the climate of the classroom?

(4) the interactions between teachers and students?

Design

In this study, I used an exploratory mixed methods design. According to Creswell and Clark (2007), in this type of design, the researcher first qualitatively explores the research topic, and then generalizes those findings through a quantitative instrument. Creswell argues an exploratory design is appropriate when the researcher wants to generalize results to different groups, to test aspects of an emergent theory, or to explore a phenomenon in depth and then measure its prevalence. Creswell (2009) categorizes this type of study as a sequential mixed methods study.

In this particular study, the qualitative phase consisted of a case study, in which I explored in depth four individual teachers using a variety of data collection procedures (Creswell, 2009). The case study was used to examine the foreshadowed problems, stated in the research questions of this study. In qualitative research, foreshadowed problems are anticipated research problems that direct the focus of the case study and guide the researcher throughout the study. They are broad, general questions, focusing on the What? How? and Why? of the phenomenon being investigated (McMillan &Schumacher, 2006). For this particular study the foreshadowed problems, as stated in the research questions, focused on the factors associated with class size in Title I classrooms.

In an effort to collect the most reliable data during the case study, a variety of data collection procedures were used. First, interviews conducted during the case study were audio-recorded and transcribed verbatim. Additionally, participants were observed in their classroom. During this observation, through field notes I, and a co-observer

documented what instructional methods were used in the Title I classroom. In addition, the co-observer and I used an interaction diagram to record classroom interactions (see Appendix C for more detail). Finally, the emerging patterns found in the inductive analysis (discussed later in the Procedures section) of the case study were used to create a survey to gauge perceptions regarding class size effects. This survey was piloted with the participants of the case study.

In the second, quantitative, phase, the survey created during the qualitative phase of this study was applied with a larger sample so that I could generalize the results to the larger Title I population (Creswell, 2009). (In addition, the intention was to collect pre-existing student achievement data to conduct an analysis of variance, with class size as the independent variable (IV) and student achievement scores as the dependent variable (DV). However, the data sets were incomplete and summary at best.) The pre-existing data included aggregated student achievement mean scores on nine-week assessments and individual student achievement scores on the Virginia Standards of Learning (SOL) assessments for students in Grades 3 and 5 at the selected site used in the case study.

Strengths

There were several strengths to using an exploratory mixed methods design model. Creswell and Clark (2007) assert that the separate phases in an exploratory design make this design straightforward to describe, implement, and report. Another strength of this model is the appeal to both qualitative and quantitative audiences. Finally, this type of study is easily applied to both multiphase research and single studies (Creswell & Clark).

In this particular study, the initial qualitative phase of the study explored teachers'

perceptions of the factors associated with student success in Title I schools. The use of

this qualitative phase provided a description of a social phenomenon from participants'

perspectives (Marshall & Rossman, 2006). The understanding of the social phenomenon

explored in this study was achieved by analyzing many contexts of the participants and

by narrating participants' meanings for certain situations and events (McMillan &

Schumacher, 2006). The qualitative approach enabled me, as the researcher, to interpret

these phenomena in terms of the meanings that people assign to them. In this particular

case study, the best way to answer the foreshadowed problems was to interpret the

constructions regarding Title I classrooms formed from those participants working in the

field.

The second quantitative phase generalized the findings of the first phase, through

the use of the survey. According the McMillan and Schumacher (2006), this survey

served as an objectively scored instrument to capture all aspects of the perceptions of

class size effects on student achievement in Title I schools. In addition, the quantitative

phase intended to explore the effects of class size on the success of students in Title I

schools through quantitative data analysis.

Weaknesses

Like with any study design, there were some weaknesses with using an

exploratory mixed methods design. The use of a two-phase approach required

considerable time. One major weakness was that this design was difficult to specify the

procedures of the quantitative phase when applying for initial internal review board

approval for the study. In addition, the researcher had to decide whether the same individuals would serve as participants in both the qualitative and quantitative phases of the study.

In this particular study, it was difficult to specify what survey questions would be produced from the initial qualitative phase of the study. Only after the inductive analysis of the first phase of the study was completed was there any direction of what kind of questions to be included on the survey. Additionally, the sampling of this study limited the findings to a smaller specific population.

Participants

For the initial qualitative phase of this study, the participants were chosen through a combination of purposeful sampling strategies to select information-rich cases. According to Creswell (2009), purposefully selected sites and individuals will best help the researcher to understand the problems and answer the research. I used site selection purposeful sampling for the case study, by selecting a Title I elementary school in a large, Central Virginia school district that has a large representation of minorities within the student population. For the 2009-2010 school year, the student population of the school division consisted of 49,407 students, which was comprised of 0.003% American Indian, 6.5% Asian, 36.9% Black, 4.9% Hispanic, 45.2% Caucasian, 0.001% Hawaiian, and 6.1% Unspecified (VDOE, 2010). The particular Title I school was chosen for its representativeness in student population. In comparison with the percentages of the school division, the student body at the selected Title I school for the 2009-2010 school year consisted of 478 students, which was comprised of 0.83% American Indian, 10.7%

Asian, 25.9% Black, 28.5% Hispanic, 26.8% Caucasian, 0.42% Hawaiian, and 6.9%

Unspecified (VDOE, 2010). In addition, intensity sampling was used to initially invite

information-rich cases to participate in the case study (Marshall & Rossman, 2006).

Specifically, the participants from the chosen Title I school site were invited to

participate in the case study based on the fact that they were experienced Title I teachers

in Grades 3 and 5, having taught for at least five years or more in Title I schools, and had

a developed level of comfort with the researcher. Grades 3 and 5 were chosen, for both of

those academic years have been tested on the Virginia Standards of Learning (SOL)

assessments the longest. Participation in this study was voluntary. The identity of all

participants and the site remained confidential for the purpose of this study.

In the second phase of the study, Title I teachers at all Title I schools within the

same school system were invited to participate in the survey created during the initial

qualitative phase of this study. A list of all Title I schools within the school district was

obtained through the district's School Administration Office. I then contacted the

administrators of all of the Title I schools by letter (see Appendix G), asking their

permission to distribute the survey to the teachers at their school. There were 19 Title I

schools in the chosen school district, with approximately 20 teachers at each school site.

This yielded a projected sample size of 380 survey participants. Again, participation in

answering survey questions was voluntary and all responses were kept anonymous.

Data Sources

Due to this being a mixed methods study, multiple forms of data were gathered

within each phase of the study.

Phase I

The qualitative interviews involved the collection of word and observational data. I collaborated with each of the participants to choose a time that worked best for them to conduct both the observation and the interviews. I interviewed each participant the evening before the observation session using Interview Protocol A. Questions focused on the climate of the classroom, goals for the observed lessons, and instructional materials to be used (see Appendix B for details). After the full day observation, I interviewed each participant again using Interview Protocol B. Questions focused on teaching experience, instructional methods used within the classroom, and perceptions on class size (see Appendix D for details).

Throughout the observations, my role as the researcher, as well as the role of the co-observer, remained that of an observer. The co-observer and I observed each participant for an entire school day in their classroom, making in-the-field notes without participating in classroom interactions. During the observation data was collected on what instructional methods were being used within Title I classrooms through field notes, as well as recorded classroom interactions using the Interaction Diagram approach (Appendix D) that was customized for this study from one of the observation tools, discussed by Glickman, Gordon, and Ross-Gordon (2007). Classroom interactions between teacher and student, as well as student and student, were noted through directional arrows drawn on the diagram. Both interactions within the classroom and instructional methods used within the classroom were coded during the observation using a customized coding protocol (see Appendix J for full details). According to Creswell

(2009), an advantage to this type of observation is that it is useful in exploring topics that may be uncomfortable for participants to discuss.

The second interviews were conducted face-to-face with the participants. These were key-informant interviews with a set of predetermined open-response questions (see Appendix D) to obtain data of how participants conceived their world and how they explained or made sense of the important events in their lives (McMillan & Schumacher, 2006). In particular, these interview questions were used to investigate teachers' perceptions and experiences on the effects of class size on decision-making processes within the classroom and student achievement. Some sample interview questions included: (a) Describe the type of students you service at your current school.; (b) Thinking of your different years of teaching, describe a year that was most difficult for you?; and (c) If there are any, what are some aspects that may influence your pedagogical decisions within your classroom?

Phase II

The second phase of this study was guided by the findings from the first. After coding the interviews for any emerging themes in the data (see discussion in the Procedures section of this chapter), I used the themes to create survey questions on teachers' perceptions of class size effects. This survey was given to a larger Title I population in the same school district, as a way of trying to generalize the findings from the qualitative phase of this study. I conducted descriptive statistical analyses on each question. For reporting purposes, the frequency of each response was used.

Finally, to explore the class size effects on systematic assessment data in Title I schools, I obtained student achievement scores on the Virginia SOL assessments for Grade 3 and Grade 5 students at the Title I school site used in the case study. Scores for Grade 3 were used to examine student learning at the primary level, and Grade 5 scores were used to examine student learning beyond the primary years at the elementary school level. (It was the intention to show the growth of student achievement for each year by accessing the data from the nine-weeks assessments from the school for those same years respectively. In addition, as intended an analysis of variance was to be conducted on the student achievement scores on both the Virginia SOLs and nine-weeks assessments.) In both instances, it was the intent to use class size as the independent variable (IV) and student achievement scores as the dependent variable (DV). After the analysis of variance had been conducted, it was intended that class means would be compared to explore whether there was a difference among the different class sizes that were experienced.

Procedures

Phase I: Qualitative Approach

The participants were contacted by letter (see Appendix A), explaining the details of the study and inviting them to participate in the study. They chose freely on whether or not to participate. Upon deciding to participate in the study, each participant and I set a date that was convenient for them to be observed for a full day in their classroom setting. Through the use of an alias, each participant's identity, as well as the identity of the school was kept anonymous for protection of privacy.

Interview Protocol A. Each observation started with a phone interview with the participating teacher, ranging from 15 to 25 minutes in length, regarding the participating teacher's Instruction Plan (adapted from Danielson, 1996) (see Appendix C) the evening prior to the classroom observation. Questions on the instruction plan focused on classroom climate, instructional goals and methods to be used in the classroom, and teacher expectations. Each phone interview was audio recorded, transcribed verbatim, and given a copy to each of the participants.

Classroom Observations. During each observation I, along with a co-observer, collected data on what instructional methods were being used within the Title I classroom through field notes, and made note of teacher-student relationships using a diagram of classroom interactions (adapted from Glickman, Gordon, & Ross-Gordon, 2007) (see Appendix D). This diagram was used for coding teacher and student interactions in five-minute intervals. A stopwatch was used to time each time segment. At the start of each new time segment, a new Interaction Diagram was used. These were numbered and kept in chronological order. The coding process began as the students walked in the classroom for the school day, and continued throughout the whole day in each classroom as instruction was delivered, until the students left for the day. However, before the observations were conducted, several criteria needed to be addressed.

Set-up for the classroom observations. Prior to the observation process (as required by the school division) I contacted the parents of each student in every participating classroom by letter (see Appendix B). This letter explained that a co-observer and I would be in the classroom making observations on classroom interactions.

In addition, the letter explained that students would not be identified in any way. The week prior to the observations, I went to each of the participating classrooms after the end of the school day to sketch the layout of the classrooms. This was in an effort to make the coding of each observation easier. Those hand sketches were then used to make a graphical representation on the computer (see Appendix D for a general representation) to be used as a classroom diagram during the coding process.

Training. The co-observer was sent a copy of the Observation Coding Protocol (see Appendix E) two weeks prior to the observations. The co-observer and I went over each piece of the protocol prior to the observations to answer any questions. The original Observation Coding Protocol included codes to show the direction in which an interaction was taking place, symbols indicating a positive or negative interaction, student gender, Exceptional Education students, and type of instructional method being used within the classroom. Table 1 gives a description for each coding symbol that was used on the original Observation Coding Protocol.

Table 1

Original Observation Coding Protocol

Observation Coding Protocol

Symbol	Description
→	Indicates the direction of a verbal interaction made between teacher and student, as well as between students within the classroom.

+	Indicates a positive interaction between members of the classroom. Positive interactions include: teacher facilitating classroom instruction, teacher greeting students as they come in the classroom, teacher building warm and trusting relationship with students through warm and supportive conversation, teacher answering student questions with a positive demeanor, teacher giving students positive reinforcement, teacher offering praise of students, students participating in classroom discussions, students asking purposeful questions, and students helping peers.
−	Indicates a negative interaction between members of the classroom. Negative interactions include: teacher interrupting instruction to manage student discipline issues in the classroom, teacher re-directing off-task students, teacher answering student questions with a negative demeanor, students interrupting the instructional process with outbursts, students asking deterring or off-task questions, students antagonizing or bullying peers, students interrupting instruction to report a behavioral issue, conflicts between teacher and student or student and student.
*	Indicates a student with Exceptional Education needs.
○	Indicates a female student.
□	Indicates a male student.
CC	Indicates teacher connecting culturally with students by relating effective practices to the social, cultural, and historical characteristics and backgrounds of students in the classroom.
SG	Indicates the use of small group instruction. Small group instruction includes: ability grouping of students that enable students to interact with their peers and teacher, student instruction delivered through different centers throughout the room.
I	Indicates the teacher providing individualized instruction. Individualized instruction includes: the altering of activities to meet the needs of individual students, the used of small ability groups during instruction, computer-assisted learning activities for students.
T	Indicates the use of technology and computer-assisted instruction within the classroom. This includes the use of student computers, Promethean Interactive Boards, and laptop computers during instruction.

For training purposes, the co-observer and I conducted a pilot test of the

Observation Coding Protocol by visiting the classroom of a volunteer Grade 3 teacher at

the same Title I school, who was not participating in the study. This teacher could not

participate in the study only due to not having enough years of experience.
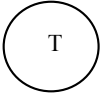
The pilot test was conducted for a length of one hour during a Language Arts lesson in the afternoon. Interactions between teacher and student, as well as student and student, were coded in five-minute intervals using the Diagram of Classroom Interactions (see Appendix D). In addition to coding interactions, the co-observer and I made field notes of what was being observed in the classroom. A stopwatch was used to time each interval. At the end of each five-minute interval, a new page of the Diagram of Classroom Interactions was used. Each page was numbered to keep the documents in chronological order.

Upon completing the pilot test of the Observation Coding Protocol coding process, suggestions were made by the co-observer and myself on additional symbols that needed to be used. The revised Observation Coding Protocol (see Appendix E) included new symbols for indicating teacher location throughout the room, absent students or empty seats, what type of work was being completed by students, time taken during times of transition, and letters for pods of desks that represented a table. In addition, new criteria were added to the definition of negative and positive interactions. While "students raising their hand while practicing good classroom etiquette" was added to positive interactions, "teacher failing to recognize student needs" was added to the negative interactions. Students raising their hands to ask questions or participate in classroom discussions was viewed as the student being on-task and actively engaged in the learning process. However, if a student was raising his or her hand to ask a question, and the teacher was too engrossed in helping another child or too busy to notice that child, that was then coded as a negative interaction on the revised Observation Coding Protocol, as

the teacher was "failing to recognize student needs." Table 2 indicates the new codes that were added to the revised version of the Observation Coding Protocol. These were used during the coding process of the four classroom observations conducted during the case study.

Table 2

Revisions to the Observation Coding Manual

Symbol	Description
T	Indicates the **placement of the teacher** throughout the classroom.
/	Indicates an **absent student/empty seat** within the classroom.
IND	Indicates students doing **independent work**. This includes any activities in which the students participate in or complete on their own.
WG	Indicates a **whole group** activity in which the teacher addresses the class as a whole.
[Time]	Indicates the **amount of time** it takes for the students in the class to settle down during and after transitions within the classroom.
A,B,C,D	Indicates a **group of desks** arranged to form a **table** in the classroom.
RH	Indicates a student participating or actively engaged with a **raised hand**

Due to the busy nature of a classroom, the use of a co-observer enabled for a more rich data collection process. Interactions occurred throughout the whole classroom in each observation. Therefore, the co-observer was able to concentrate on one side of the room, while I concentrated on the other. Later, when analyzing the observation diagrams and field notes, coding for the same interaction was only counted once in the total

number of interactions within the classroom. Coding for different interactions was counted separately in the total count of interactions.

Furthermore, the busy nature of the classrooms created a natural change in the coding process. Initially, the co-observer and I began with drawing arrows on the actual diagram to indicate the direction of an interaction. However, this became increasingly difficult, as the participating teachers moved constantly throughout the classroom as they taught. As they walked throughout their classrooms, it became increasingly difficult to code for the interactions. This coding quickly moved from the diagram of the classroom to the section of the field notes. Arrows were still used to indicate the direction of an interaction, only now to student numbers. Numbers were placed on each student desk of the classroom diagram, along with symbols for student gender. In addition, because the location of the teacher would quickly change, we coded the location of the teacher during an interaction and numbered each interaction to maintain the chronological order of the interactions. Refer to Figures 7 and 8 for examples of how coding during the observations changed. Figure 7 shows the original arrows that were used to diagram each interaction. As shown, it was both hard to implement, as well as difficult to analyze. Figure 8 shows the use of numbering each interaction. The arrows were still used, only on a smaller scale to indicate the direction of an interaction. Both figures represent the same five-minute time segment.
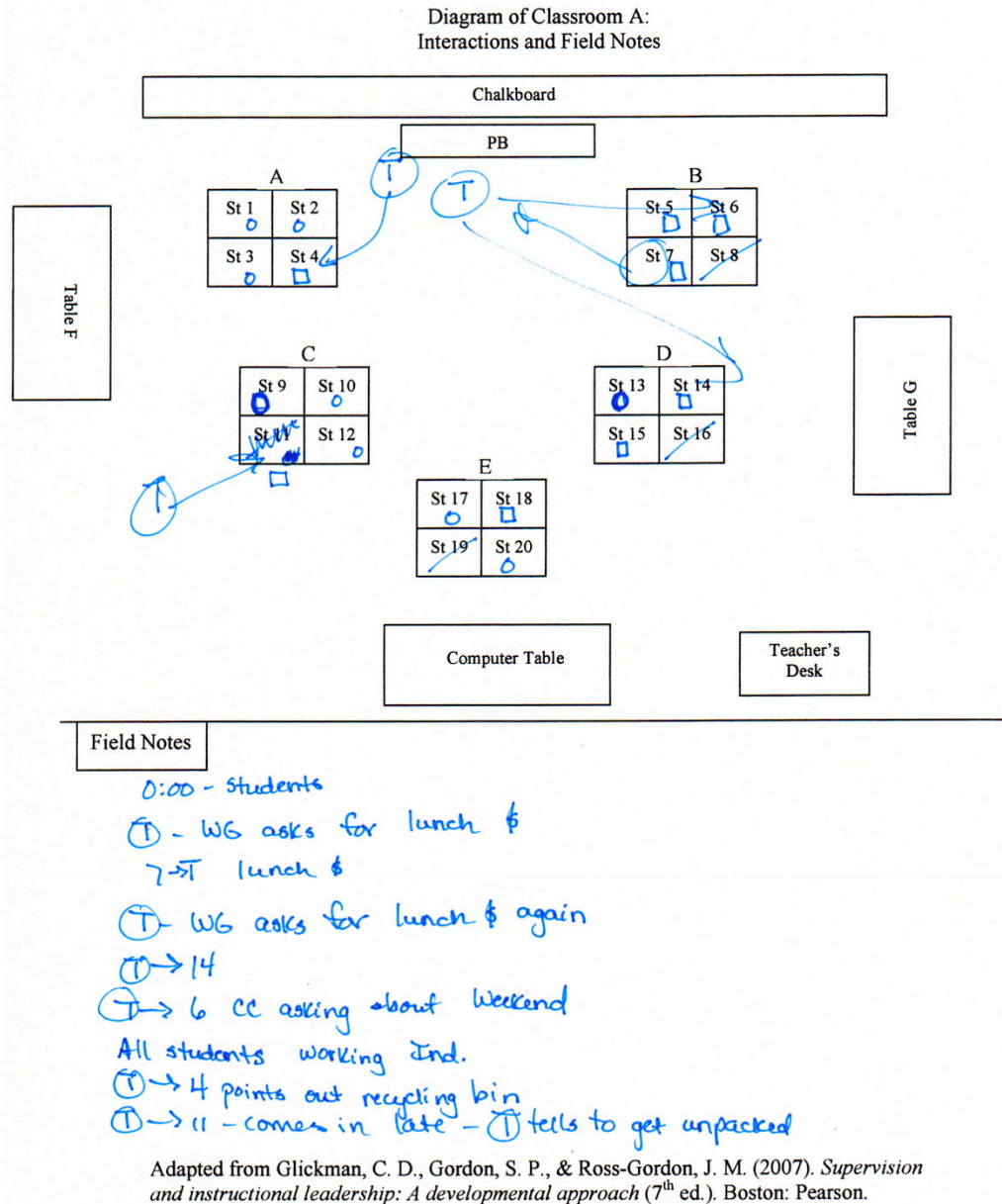
Figure 7. Researcher copy of the Observation Diagram from Classroom Observation A.

Diagram of Classroom A:
Interactions and Field Notes

Chalkboard

PB

A
| St 1 | St 2 |
| St 3 | St 4 |

B
| St 5 | St 6 |
| St 7 | St 8 |

Table F

C
| St 9 | St 10 |
| St 11 | St 12 |

D
| St 13 | St 14 |
| St 15 | St 16 |

Table G

E
| St 17 | St 18 |
| St 19 | St 20 |

Computer Table

Teacher's Desk
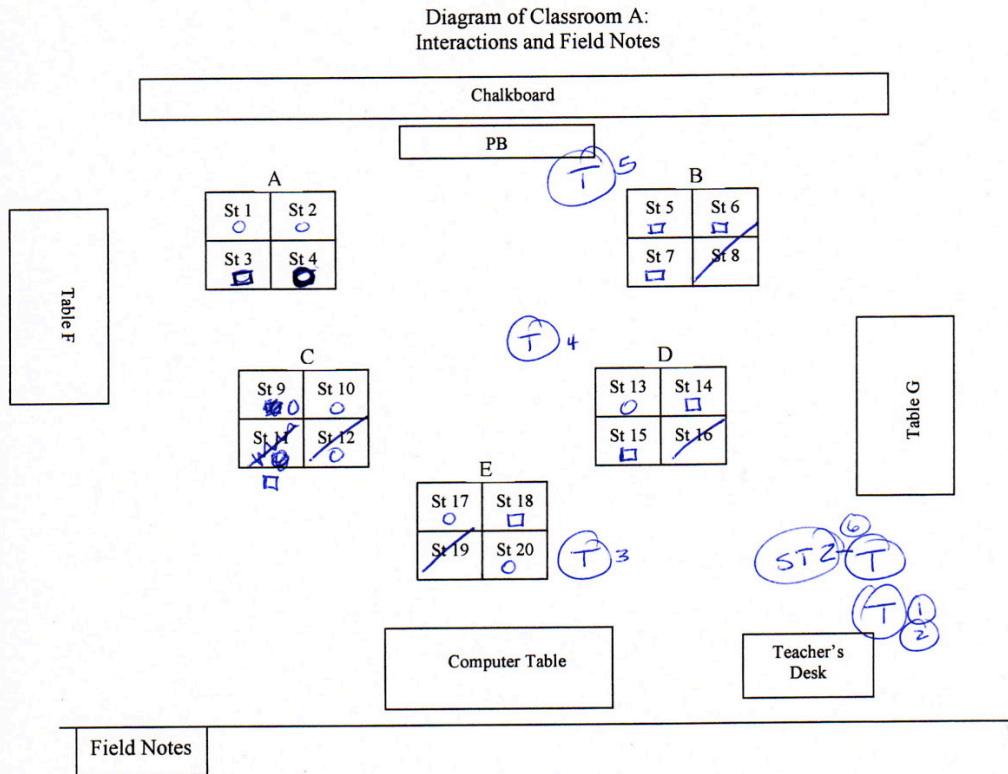
Field Notes

I - Cutting

asks for Lunch 3 students go up to her desk
last call for Lunch
→ ST6 Brian Come here, Take this to ... conv. weekend
Walks around collecting scrap paper
→ ST20 - You'll be in charge
→ ST4 - Recycle bin
ST 12 arrives →
→ ST11 → You were at breakfast ST11 → T shakes head → ST12 was "" there?
ST 2 → T

Adapted from Glickman, C. D., Gordon, S. P., & Ross-Gordon, J. M. (2007). *Supervision and instructional leadership: A developmental approach* (7th ed.). Boston: Pearson.

Figure 8. Co-observer copy of the Observation Diagram from Classroom Observation A.

Interview Protocol B. After the full day observation I conducted a face-to-face interview with each participant using a predetermined set of questions (see Appendix H). At the start of each interview I went over an interview guide (see Appendix F) explaining the interview procedures, and had participants sign the informed consent form (see Appendix G). The interview guide discussed how the participant's identity would be kept private as well as the need for audio-recording the interview. Each interview was audio-recorded for reliability purposes. These audio-recordings were used to transcribe the interviews using the participants' language to make verbatim accounts. For coding purposes, I asked each participant to give herself an alias to increase confidentiality. As explained in the interview guide, each participant received a copy of the transcribed interview to provide for member checking (McMillan & Schumacher, 2006). At that time, each participant was given the opportunity to modify their responses for accuracy if they didn't like how they worded something the first time. This allowed them to corroborate any information that I gathered from the interview. In this instance, they would have received a copy of the edited interview as well. The use of mechanically recorded data, member checking, and participant review are all strategies that were used to enhance the validity of the qualitative phase of this study (McMillan & Schumacher).

Interviews were semi-structured, using a pre-determined set of questions (see Appendix H). However, had any significant information become known during later interviews, there was flexibility within this set of interview questions.

Data analysis. Using the transcribed verbatim accounts of Interview Protocol A and Interview Protocol B, I used a combination of manual and electronic data analysis to conduct inductive data analysis. This type of analysis was used to code the information gathered during the interviews. I looked for any emerging themes in the information provided by the participants. As themes of meaning emerged, I used those themes to establish codes for the information. These codes were then color-coded. Using a computer I electronically used the cut-and-file technique to group coded segments of information (as cited in Marshall & Rossman, 2006).

Once the interviews were coded, I used the coded information to create survey questions. These questions then underwent a review of experts in the education and Title I fields. Upon the completion of expert review, the survey was given to the interviewed participants to answer. This enabled the participants to check for accuracy in the information that was coded from the interviews, as well as pilot test the survey questions.

Phase II: Quantitative Approach

The second phase of this study was guided by the findings from the first. The larger sample of Title I teachers in the same school district were invited to complete the survey created during the qualitative phase, as a way of trying to generalize the findings beyond the case study school. To recruit participants for the second survey, a letter was sent to all principals of Tile I schools in the same school district asking for permission to administer the survey (see Appendix J). Upon receiving permission to administer the survey, I personally delivered the survey to the mailboxes of each teacher at the participating Title I schools. The survey included a cover letter (see Appendix K)

explaining the purpose of the survey. The letter also explained that the survey was only voluntary and all participants and schools would remain anonymous. To ensure privacy and anonymity, I enclosed a self-addressed stamped envelope for the return of each survey.

Finally, to explore class size effects on systematic assessment data in Title I schools, pre-existing student assessment data was analyzed. These data were provided from two sites. First, the nine-weeks assessment data were obtained from the Title I school used in the case study. These student assessments were filed at each individual school within the district. This was the only way to obtain these student achievement scores. I had the intention of looking at the number of students per class and what the class mean scores were for the 2005-2006, 2006-2007, and 2007-2008 school years for Grades 3 and 5. In addition, the Virginia SOL scores in all subjects for the same students were obtained from the School Administration Office of the school district. It was the intent to conduct an analysis of variance on both nine-weeks assessment and SOL score data, where class size would have been the IV and student achievement scores would have been the DV.

Data Analysis

The following research questions were analyzed through several sources of data: What aspects associated with class size identified by teachers (extracted from open-ended discussions with teachers in Title I schools) either enhance or detract from:

(1) the pedagogical decision-making processes that go into daily learning?

(2) the management of the classroom?

(3) the climate of the classroom?

(4) the interactions between teachers and students?

Interviews with teachers provided information regarding perceptions of class size effects on student achievement from the case study level. The interviews underwent inductive analysis through coding for emerging themes in data collected. Classroom observations provided in-the-field information regarding pedagogical decision-making processes, classroom management, and classroom interactions. The survey then provided the same information from a larger Title I population in the same school district. Descriptive statistical analyses were conducted on each question. For reporting purposes, the mean score for specific survey questions and the frequency of each survey response were used.

Student achievement scores in all subjects the Virginia SOL assessments were collected for Grades 3 and 5 at the school used in the case study to measure class size effects on systematic assessment data. Additionally, it was the intent to collect student achievement scores on the nine-weeks assessment data as well. With both sets, the intended analysis of these test data was an analysis of variance. The class size the students experienced in each year of the provided data was going to be used as the IV, and the student achievement scores on both assessments was going to be the DV.

CHAPTER FOUR: FINDINGS

Restatement of the Purpose

The ultimate purpose of this study was to provide additional insight into how class size affects student learning of students in Title I schools. Of the many facets of that insight, this study explored the perceptions of experienced teachers in Title I schools concerning class size and how it influences student achievement. This study collected data from open-ended interview questions, the researcher's field notes, survey responses of Title I teachers, and pre-existing student achievement data. Thus, this study is a mixture of qualitative and quantitative research, using an exploratory mixed methods design model (Creswell & Clark, 2007) of reporting research findings.

The content of this chapter is a presentation of the qualitative and quantitative data that were collected by the researcher. The findings for this study were obtained during two separate phases. The first qualitative phase consisted of a case study conducted at a Title I elementary school in central Virginia. In this case study, data were collected through classroom observations and interviews with experienced Title I teachers. The second quantitative phase was driven by the findings from the first qualitative phase, in which interview responses were coded and used to create a survey that was distributed to a larger population of Title I teachers in the same school district. In addition to the survey, an attempt to collect pre-existing student achievement scores on the Virginia Standards of Learning (SOL) assessments, and nine-weeks assessment data was conducted with the intention to explore the effects of class size on systematic

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assessment data at the school site that participated in the case study. The following sections discuss the findings from each phase of this study.

Phase I: Qualitative

The qualitative phase of this study encompassed three separate pieces: a phone interview, classroom observations, and a face-to-face interview. The phone interview followed Interview Protocol A, and served as a preparation for the classroom observations. The findings from this phase were then used to drive the second quantitative phase of this study.

Classroom Observations

Set-up for the observations. Each participant was given the opportunity to choose an alias for reporting purposes as to ensure anonymity during the observation and interview processes. "Scarlet" and "Michaela" both teach Grade 3, and "Cameron" and "Jennifer" Grade 5. Experience among these teachers ranged from six years to twenty-four years of teaching experience. As preparation for the full-day classroom observations, each participant started with a phone interview discussing the details of the next days' lessons. The purpose of the full-day observation was to gain insight into a typical day in each of the participants' classrooms.

Interview Protocol A. Each observation started with a phone interview, ranging from 15 to 25 minutes in length, regarding their Instruction Plan, as adapted from a Danielson's (1996) professional practice instrument (see Appendix C) the evening prior. During these interviews, Scarlet, Michaela, Cameron, and Jennifer discussed the instructional characteristics and climate of their classes, as well as the goals for the

lessons that were to be observed the following day. In doing so, they all reported that their classrooms had a great variety of students in terms of academic ability. In addition, each had a sizeable number of five to eight English Second Language (ESL) students in her classrooms, as well as a few Exceptional Education students. The students in each class were described as multi-leveled academically. In regards to the academic ability of each classroom, Cameron expressed this best when she commented that

> I have eight ESL. I have…three that are unable to read much above a Primer
>
> Level, three that are above grade level – generally above grade level, and the
>
> majority of my class, I would say, is more average – and needs a lot of simple,
>
> repetitive, small group type of instruction. (Cameron)

Scarlet, Michaela, Cameron and Jennifer all explained how their grade levels switched classes for certain subjects. Scarlet and Michaela both explained that Grade 3 students switched classes for Reading and Language Arts. The classes were based on ability groups. Scarlet taught the students who were labeled "Title I" in Reading ability, as well as those who were slightly above being labeled "Title I" and needed remediation. Michaela taught the group comprised of ESL students pooled together from all four Grade 3 classes. In contrast, Cameron and Jennifer explained that Grade 5 students switched classes for each of the core content areas. Each Grade 5 teacher was responsible for teaching Reading and Language Arts to her homeroom students, and then one core content area to the whole grade level. Cameron taught Social Studies (or History) to Grade 5, and Jennifer taught Science.

In discussing the goals for the following day's lessons, all four mentioned working on Daily Oral Language (DOL) exercises in Language Arts. Additionally, in Grade 3, they would be working on narrative elements in Reading, addition and subtraction with regrouping digits in Mathematics, and a Geography unit in Social Studies. Cameron and Jennifer were both going to focus on comprehension strategies in Reading. In the specified core content areas, Cameron was going to focus on the House Burgesses, while Jennifer was going to focus on aspects of the rock cycle. Table 3 provides an outline of the lesson goals for each participating teacher. Additionally, codes were used to represent the students in each group taught by each teacher. For example, 3S would indicate Scarlet's Grade 3 homeroom group of students, and 3SM++ would indicate a mix of students from Scarlet's, Michaela's and the other two Grade 3 teachers' students.

Table 3

Lesson Goals for Classroom Observations

Teacher	Group of Students	Subject	Goals of the Lesson
	3SM++ (Title I)	Reading	Identifying narrative elements
	3SM++ (Title I)	Language Arts	Daily Oral Language Grammar Skills
Scarlet	3S	Mathematics	Addition and Subtraction with regrouping digits
	3S	Social Studies	Identifying Geographical elements: oceans, continents, Equator, and Prime Meridian

	3MS++ (ESL)	Reading	Identifying narrative elements
	3MS++ (ESL)	Language Arts	Daily Oral Language Grammar Skills
Michaela	3M	Mathematics	Addition and Subtraction with regrouping digits
	3M	Social Studies	Identifying Geographical elements: oceans, continents, Equator, and Prime Meridian
	5C	Reading	Comprehension Strategies Making connections between students' prior knowledge and the story
Cameron	5C	Language Arts	Daily Oral Language Using and identifying prefixes Using transition sentences in Writing
	5C 5J 5+	Social Studies	Discussing the importance and significance of the House of Burgesses
	5J	Reading	Comprehension Strategies
Jennifer	5J	Language Arts	Daily Oral Language Using and identifying prefixes
	5J 5+ 5C	Science	Defining and identifying sedimentary and metamorphic rocks

Regardless of grade level or goals for the lessons, the responses from all four teachers to the questions affirmed the appropriateness of the goals for the lessons, that the goals of the lessons supported district and state standards, that the goals related appropriately to a broader curriculum, and that the use of student assessments were appropriate. Scarlet, Michaela, Cameron and Jennifer all responded that the goals for

each lesson were based on the curriculum standards and pacing guides that were provided by the school district, which in turn were mandated by the state's curriculum framework. In addition, all lessons were based on the Virginia SOL assessments. All four teachers explained that regardless of the level of the students that were being taught, the source of the goals remained the same. The only aspect that changed was how they each presented the material to the students, based on the students' abilities and needs. Therefore, the goals were suitable for each group of students. Furthermore, all four teachers stated the goals of the lessons related to a broader curriculum in that all four teachers planned lesson activities that were cross-curricular in nature. In general, Science and Social Studies were integrated into Reading and Language Arts with reading topics and writing assignments. They also integrated Mathematics into Language Arts with different writing topics. This level of thoughtful preparation and attention to the larger issues of curriculum integration attested to the professionalism of these teachers.

The last point that echoed among all four teachers was that student achievement drove instruction. Scarlet, Michaela, Cameron, and Jennifer all expressed that both formal assessments--such as tests and quizzes--and informal assessments--such as projects, classroom discussions, and teacher observations--guided the instruction within the classroom. For example, if a teacher's observation indicated that a concept seemed to be too difficult for the students, each teacher stated they would slow their instruction down and provide remediation or re-teach the concept in a different way. Conversely, if a concept seemed too easy, each teacher stated they would move on to the next topic or provide enrichment.

The type of student engagement activities was individual to each participant's teaching style. However, the common threads among Scarlet, Michaela, Cameron and Jennifer's techniques were the use of small group instruction and hands-on activities to engage students in learning, as well as the use of a variety of instructional methods which they utilized on a daily basis.

The use of technology to engage students in learning was one area where each of the responses differed. At this particular Title I school, select classrooms were equipped with an interactive Promethean Board. According to the manufacturer's literature, the Promethean Board is an interactive whiteboard that provides a large interactive display that combines the simplicity of a whiteboard, power of a computer and front projection. Promethean interactive whiteboards engage students with vivid images, video and audio. According to the Promethean Board website (2010), it "enables anything that can be seen or done on a computer screen to be projected onto an interactive whiteboard – bringing every classroom to life," (Interactive Whiteboard Solutions section, ¶ 1)). Both Scarlet and Michaela, the two Grade 3 teachers, had the Promethean Board technology in their classroom, and described how they would use them during the observation, along with other teaching strategies. In discussing the use of several different strategies to engage students in the lessons, Scarlet explained that:

> With Math…I'm [going to] be using the Promethean Board and having students come up and utilizing their technology, and getting them engaged that way. They are also going to be doing a partner activity…[During Reading instruction the Promethean Board will be used for whole group instruction and then] they have centers where they're going to have to be engaged. They're getting on the computer, and they are listening to the story over again, and they are completing a web of character, setting, and solution…They are the ones who are creating the pictures they are going to end up writing a story about. So, you know,

that's kind of all theirs. (Scarlet)

In contrast, Cameron (whose Grade 5 classroom did not have a Promethean board) explained that integrating technology in her classroom was a little more difficult due to her classroom being in a trailer. The trailer was not equipped with wireless Internet access, limiting the use of technology to the five classroom laptop computers. She discussed that because of her teaching space, she conducted more whole group, small group, and hands-on activities. In particular, for the observation, in regard to student engagement, she explained that:

> I always do a few things. You know, tomorrow is the House of Burgesses. So, I always to – well – I try to have them *do* something. For tomorrow, they'll cut out a little house, and glue it in their notebooks. So, I'm hopeful the House of Burgesses will stick in their mind. (Cameron)

Jennifer (whose Grade 5 classroom also did not have a Promethean board) was also individual in her technique of providing student engagement, in that she incorporated hands-on activities within every lesson in her classroom. She discussed using hands-on activities on a daily basis, especially in Science. She explained that:

> In most everything I'm hands-on. But, I feel like first they have to know the content… I usually start off all their lessons by teaching with a demo of some type…like if it's Science I'll do an experiment type of thing, where *I'm* modeling first…Then I break them into groups where they rotate through – maybe it's stations – and they're trying out whatever it is. (Jennifer)

Pre-Observation Summary. Reviewing all of the responses to Interview Protocol A questions provided great insight into what my co-observer and I expected to see the following day during each observation. Before each observation it was clear that each lesson was based on students' needs, and that the goals followed the pacing guide of the school district and the framework of the state's standards. Additionally, it was known that a variety of instructional methods were going to be used throughout each day, which made preparing for the coding of each observation easier.

Classroom observations of interaction quality. In each of the classroom observations, my co-observer and I simultaneously coded interactions that took place within the classroom, while taking field notes. This procedure followed the approach detailed in the Methodology for this study. This study used the Interaction Diagram approach (Appendix D) that was customized for this study (as explained in the Methodology) from the observation tool, which was one of those discussed by Glickman, Gordon, and Ross-Gordon (2007). Coding started as the students arrived for the school day, and continued for all of the time the students spent in the classroom. Coding was stopped during times of resource classes and lunch, and then reinstated as students returned to the classroom. Table 4 illustrates the amount of time coded within each classroom. During the classroom observations class sizes varied from 19 to 22 students. As will become clear from the findings from the Interview section of this phase of the study, these classroom sizes would be classified as larger than the identified ideal class size.

Table 4

Total Amount of Time Coded During Each Classroom Observation

	Time Coded in the Classroom	
Teacher	Number of Time Segments	Total Time in Minutes
Scarlet	38	190
Michaela	39	195
Cameron	48	240
Jennifer	46	230

A majority of the interactions that occurred within those class sizes were positive in nature. In all four classrooms, students were on task and actively engaged in learning for a majority of the time. In reviewing the interactions that took place within each classroom, patterns within the interactions began to emerge. First, in all of the classroom observations, it was clear that the teachers were able to connect personally with the students first thing in the morning, during times of transition within the classroom, and when classes switched. These were considered down times, as the teacher was not actively involved in instructing. For example, during the observation in Scarlet's classroom, she was able to build personal relationships with students first thing in the morning, as seen in Figure 9, and while the class was lining up to go to Music class for the day in Figure 10. In Figure 9, Scarlet was able to connect with Student 6 first thing in the morning by asking about his weekend. As discussed in Review of the Literature, building relationships with students is a best practice to use with at-risk student

populations. This type of interaction has been seen to predict student's successful school

adjustment and achievement. It was noted, however, that as more students arrived to

school, the interactions of connecting with students decreased and were replaced with

interactions of giving directions and managing the classroom.

Adapted from Glickman, C. D., Gordon, S. P., & Ross-Gordon, J. M. (2007). *Supervision and instructional leadership: A developmental approach* (7th ed.). Boston: Pearson.
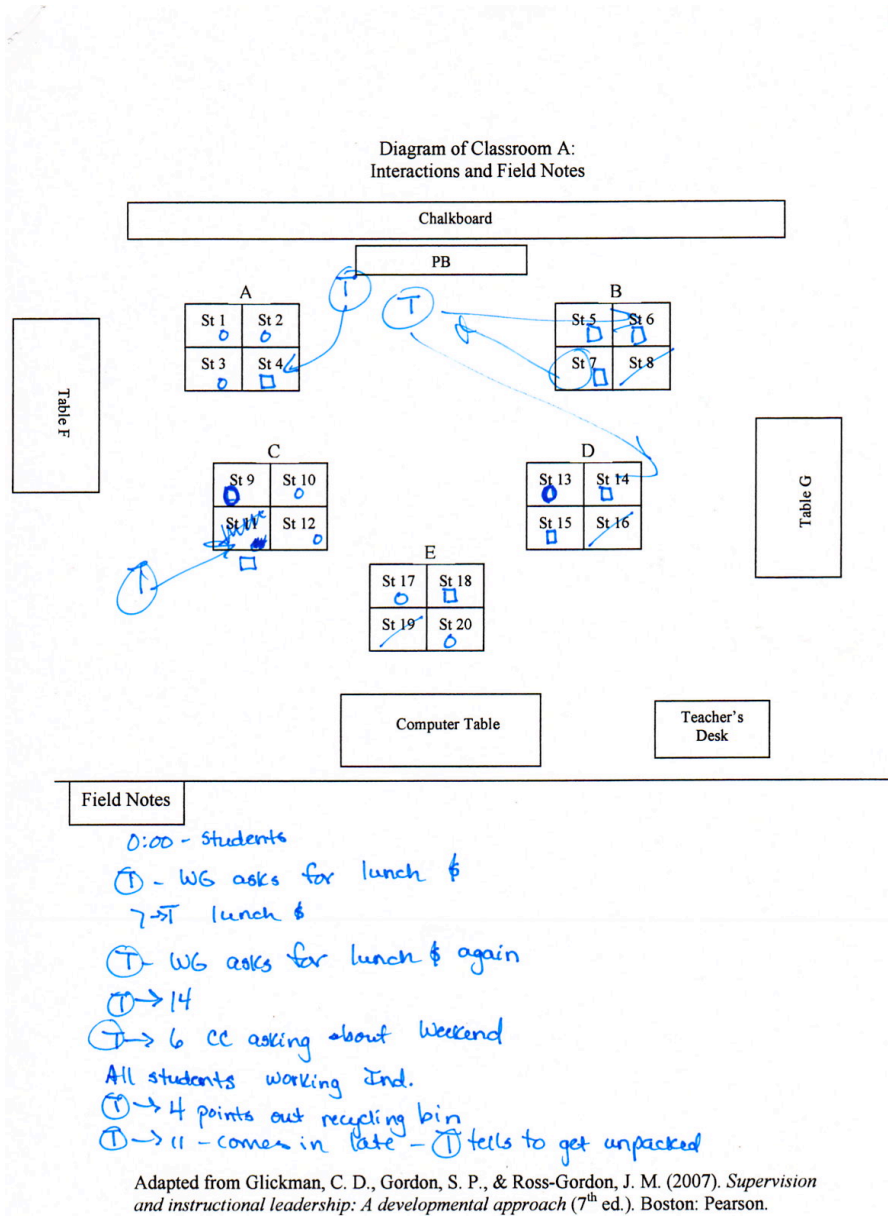
Figure 9. Teacher building personal relationships with students in the morning.

Scarlet was observed being able to do the same again in Figure 10 as the students line up to go to Music. Here she was discussing the student's trip to Kings Dominion. Later it was observed that Scarlet incorporated the student's experience into class discussion by using it as an example during whole group instruction.
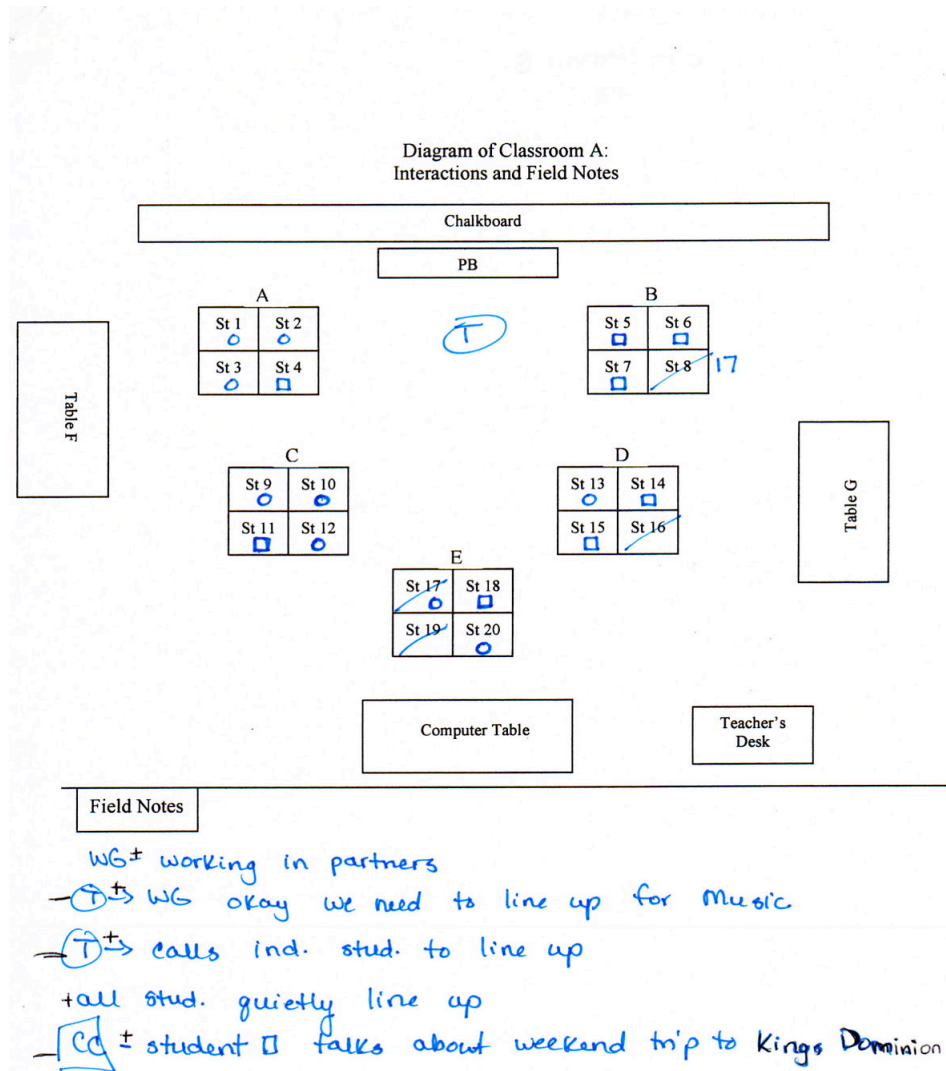
Diagram of Classroom A:
Interactions and Field Notes

Adapted from Glickman, C. D., Gordon, S. P., & Ross-Gordon, J. M. (2007). *Supervision and instructional leadership: A developmental approach* (7th ed.). Boston: Pearson.

Figure 10. Teacher building personal relationships during a time of transition.

This type of interaction happened throughout the day as well. However, as it appeared easier to devote individual attention to each student first thing in the morning, these interactions were more concentrated during those down times. Similar interactions were observed in all four classes. It must also be noted that during times of transitions it was increasingly difficult to code each interaction that occurred, as all individuals in the classroom were moving. There were other moments in which each teacher was building personal relationships with students during transition times, however they were missed due to the busy nature of the classroom of those times.

Another commonality among all four observations was the manageability of the classroom. While most interactions were positive, there were times when class discussions escalated and the teacher had to stop instruction to address student behaviors, resulting in a negative interaction. This occurred during whole group and small group activities. Figure 11 depicts a time in Jennifer's second Science class where the small group activity was escalating into off-task behaviors, and she had to stop instruction. Jennifer tried to regain the whole groups' attention, and then had to stop with stating, "I'll stop." The whole group responded with quieting down, and then moved into a whole group discussion. The student behaviors impeded the small group activity, and the teacher had to switch midstream to maintain classroom management.

Diagram of Classroom D:
Interactions and Field Notes
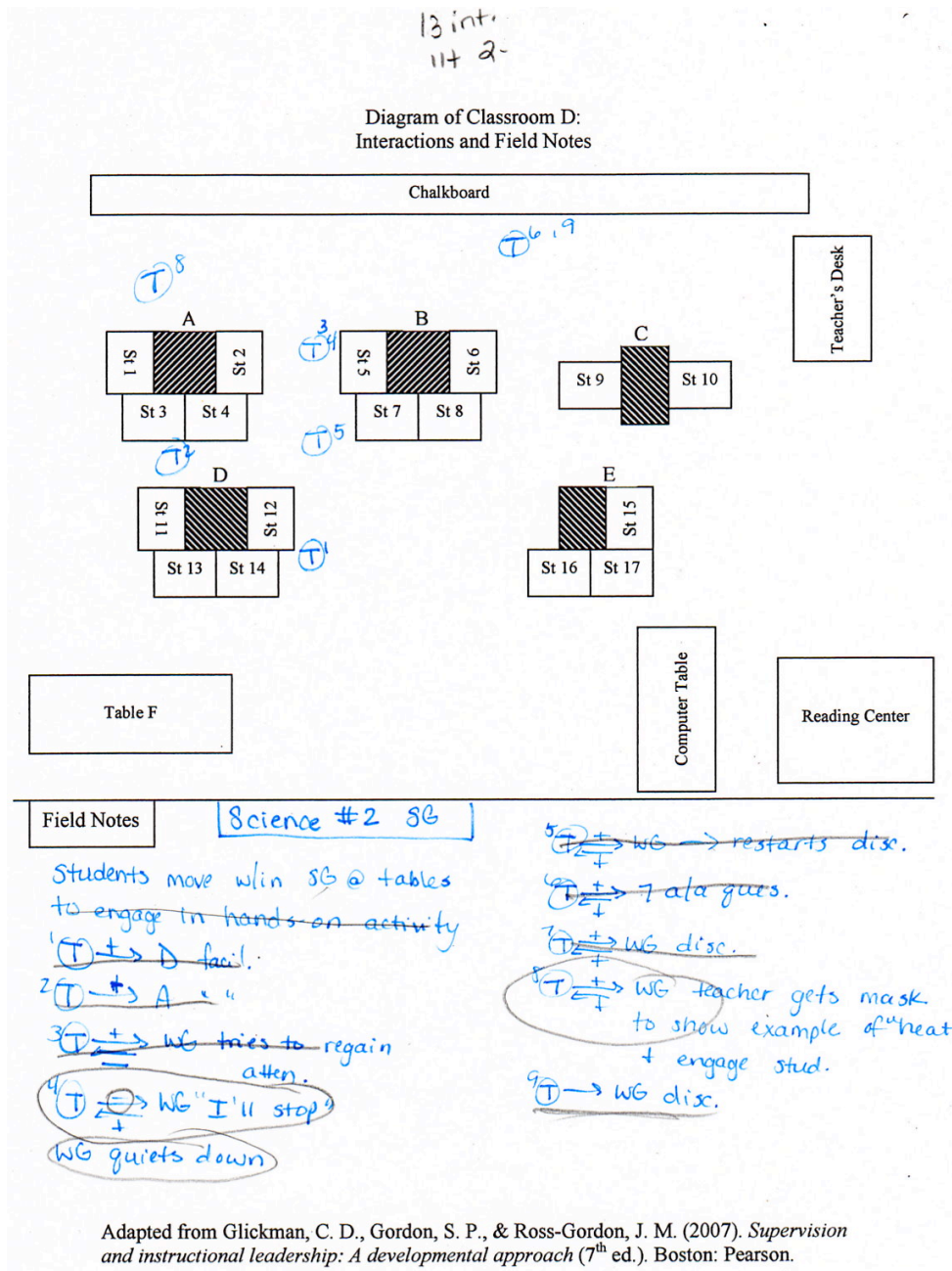
Figure 11. Teacher changing from small group to whole group activity to maintain classroom management.

Additionally, there were times when class discussions escalated with student participation, and the teacher needed to redirect the class in order to keep the lesson in

motion. Although occurrences like this were coded as positive interactions because students were actively engaged in the lesson, there were several students who were unable to share their thoughts or experiences in order to continue with the lesson in timely manner. Figure 12 illustrates how Jennifer had to limit the class discussion regarding examples of rocks that students brought from home. Student 14 brought a quartz rock from home. There was a whole group discussion about the example, followed by two negative interactions with Student 4 and Student 7. Jennifer then continued the class discussion with moving to the next topic. She later explained how she regretted not being able to allow more students to share their examples, as time was running out for the lesson and there were too many students to accommodate. This occurred in all four observations. As will become clear from the findings from the Interview section of this phase of the study, this type of occurrence caused concern for each teacher, as they explained that in larger class sizes the students' needs were not being met, as well as not receiving the attention they need.

Diagram of Classroom D:
Interactions and Field Notes
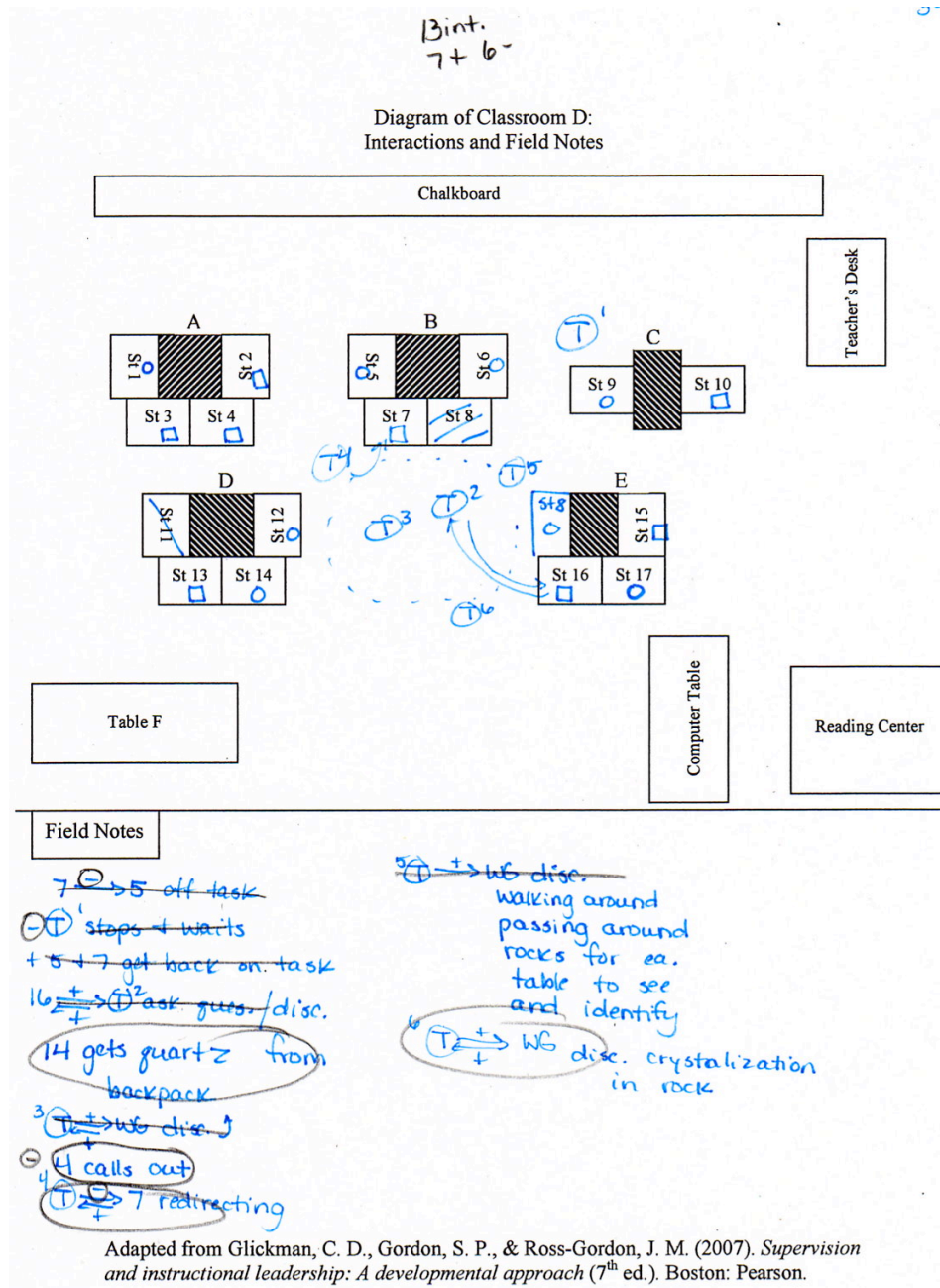
Figure 12. Teacher needing to proceed with the lesson.

From our observations, it was clear that in all four classrooms, the number of

interactions greatly increased per time segment as the day progressed. This was attributed

to the prevalence of classroom discussions and the nature of the learning process that the

teacher initiated. The number of interactions particularly increased as students moved into small group settings that rotated throughout different stations within the classroom during a lesson. In fact, coding became increasingly difficult as students moved to small group activities. During small group activities, students were placed in several different spaces throughout the whole classroom, including outside of the classroom. Additionally, there were interactions transpiring in each of the small groups. It became difficult to note the new location of each student, as well as the several interactions occurring simultaneously in each small group. Figure 13 shows the movement of students from a whole group activity into several different small group activities. In Figure 13, the observer is showing the movement of the students at table A to the Reading Center in the corner. Additionally, the students at table B are moving to Table F, students at table D are moving to the Computer Table, and students at table E are moving to Table G. The number in the top right-hand corner indicates that this was page number 34 of this particular class observation day. As explained in Methodology, my co-observer and I began a new sheet.

Diagram of Classroom A:
Interactions and Field Notes

Adapted from Glickman, C. D., Gordon, S. P., & Ross-Gordon, J. M. (2007). *Supervision and instructional leadership: A developmental approach* (7th ed.). Boston: Pearson.
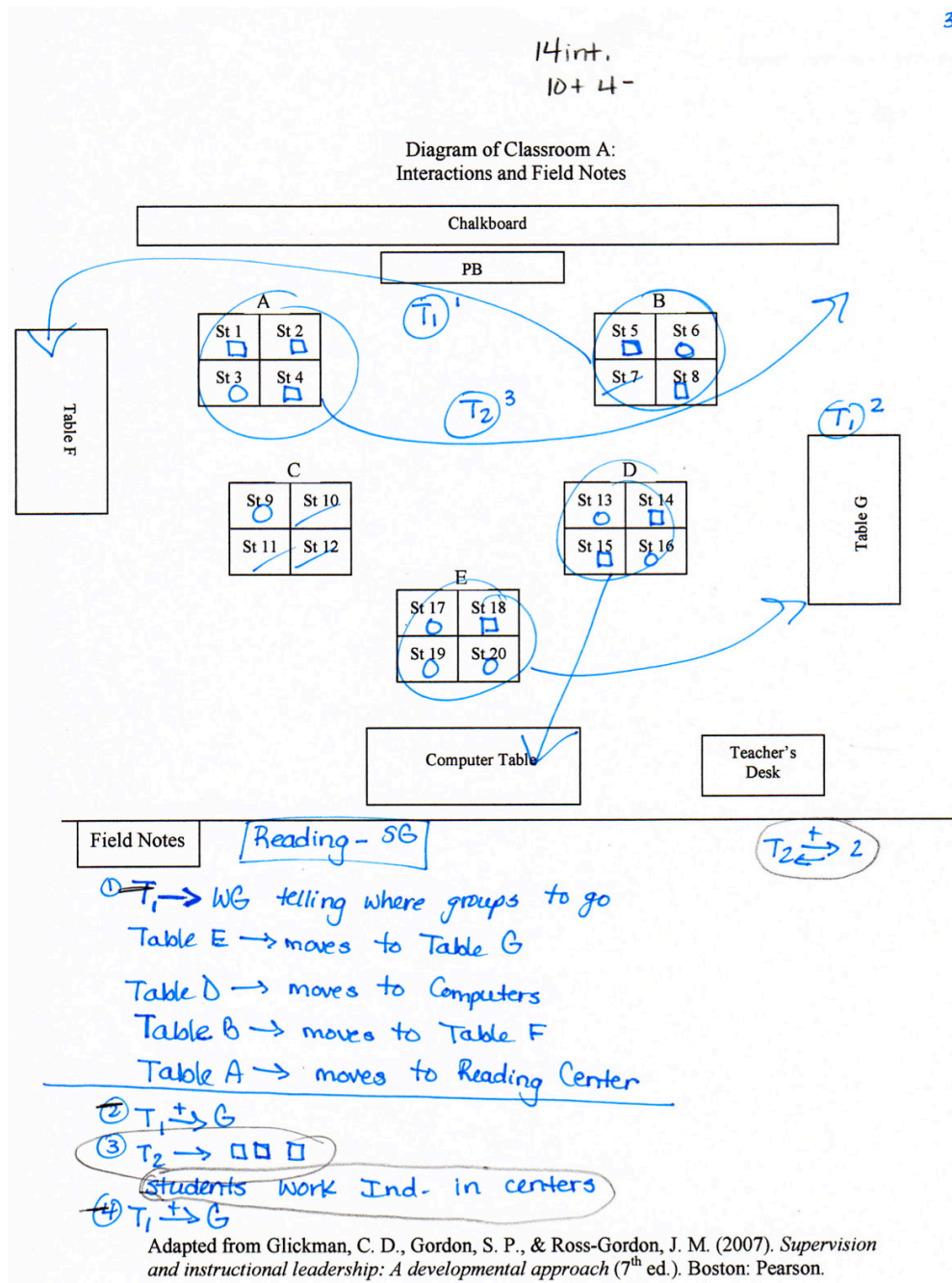
Figure13. Field notes indicating movement of students into small group activity.

During the lessons that incorporated small groups, interactions took place within each group. With only two individuals coding the classroom interactions, the coding evolved into more field note taking, indicating that small groups were being implemented

in the classroom. Notations were made for whether students were on task or off task, the teacher's location throughout the activity, as well as the teacher interactions with students within each small group or with each small group as a whole. As seen in Figure 14, Jennifer rotated from each small group of students seated at each pod of desks. As indicated in the field notes, after Jennifer gave two whole group instructions, she moved to Table A to ask and answer ("a/a") questions with the students within that small group. Meanwhile, all of the students were discussing the subject of rocks in their small group ("SG"). She then moved on to Table D, Table E, and Table C to do the same. The teacher interactions with the small groups were then followed by a positive individual interaction with Student 10. Jennifer then gave three directions to the whole class, which were coded as positive interactions. The next interaction involved the teacher giving whole group instructions on how to make a booklet for each type of rock for homework, also a positive interaction. This was followed by a negative interaction between the teacher and Student 3, as she addressed the student's talking over her instructions. Additionally, another negative interaction was coded for Student 10 calling out in class. This was followed by positive interactions between Student 15 and Student 16, and the teacher discussing the topic of marble and granite with the whole class. The latter was the last interaction coded for that five-minute segment of time. Within that five-minute segment of time, there were a total of 21 interactions, with 16 being positive and five being negative. Those five negative interactions were due to off-task student behavior, and Jennifer having to stop instruction to address disruptive behavior within the classroom. The same type of interactions occurred in the other three classrooms as well. More

negative interactions for off-task and disruptive behaviors in all four classrooms were
coded during times of small group instruction.

Adapted from Glickman, C. D., Gordon, S. P., & Ross-Gordon, J. M. (2007). *Supervision and instructional leadership: A developmental approach* (7th ed.). Boston: Pearson.
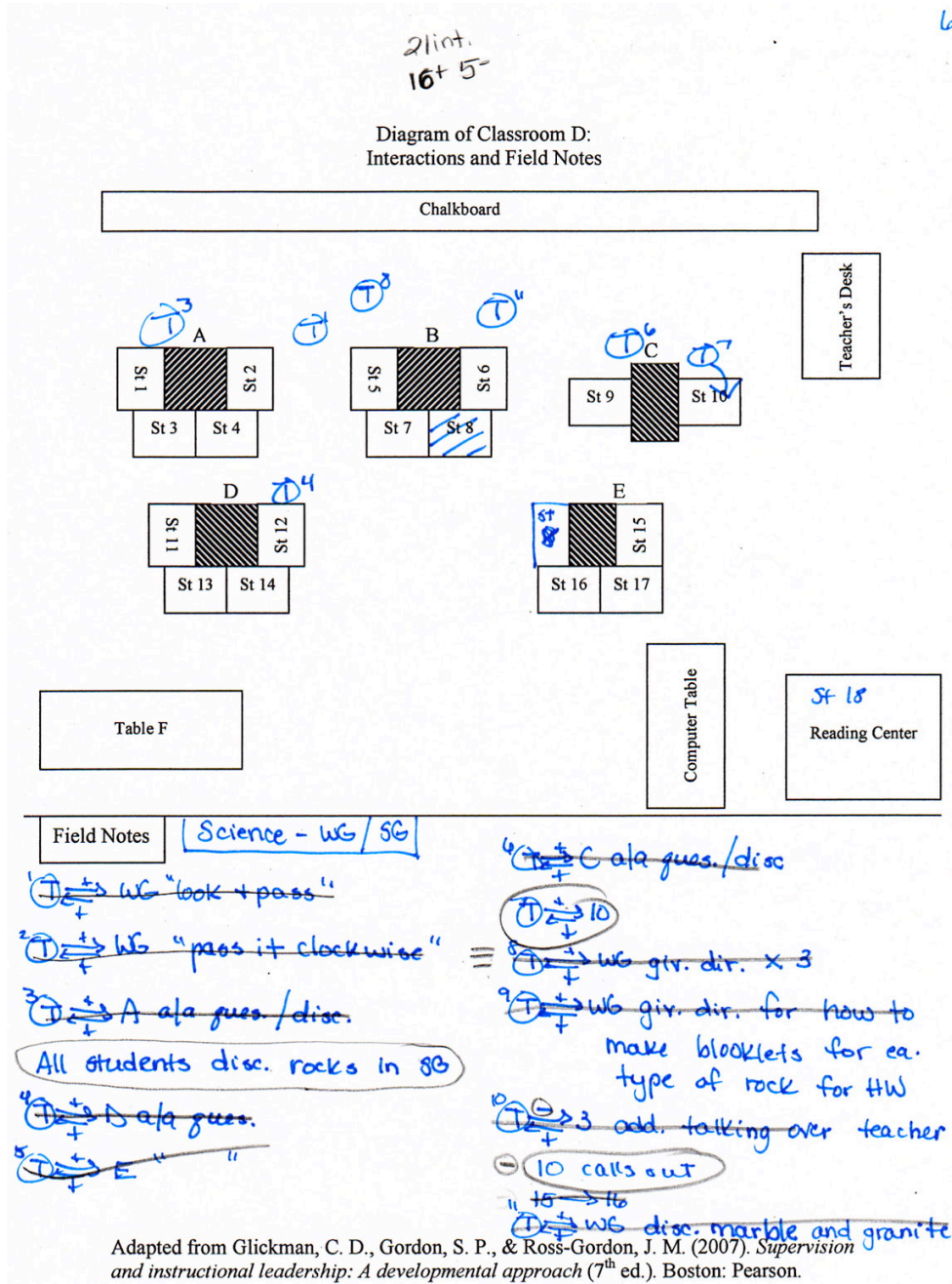
Figure 14. Coding during a small group activity.

It must also be noted that in addition to an increase in the interactions coded during small group settings, the differences in coding between the co-observer and myself increased due to several interactions taking place simultaneously. Figure 15 and Figure 16 show the coding differences for the same five-minute time segment during small group instruction in Scarlet's classroom. During the data analysis process, coding for the same interaction was indicated with a slash line, and coding for different interactions were circled. The coding for the interactions in Figure 15 and Figure 16 yielded a total of nineteen interactions, of which seven were consistent between the co-observer and myself.
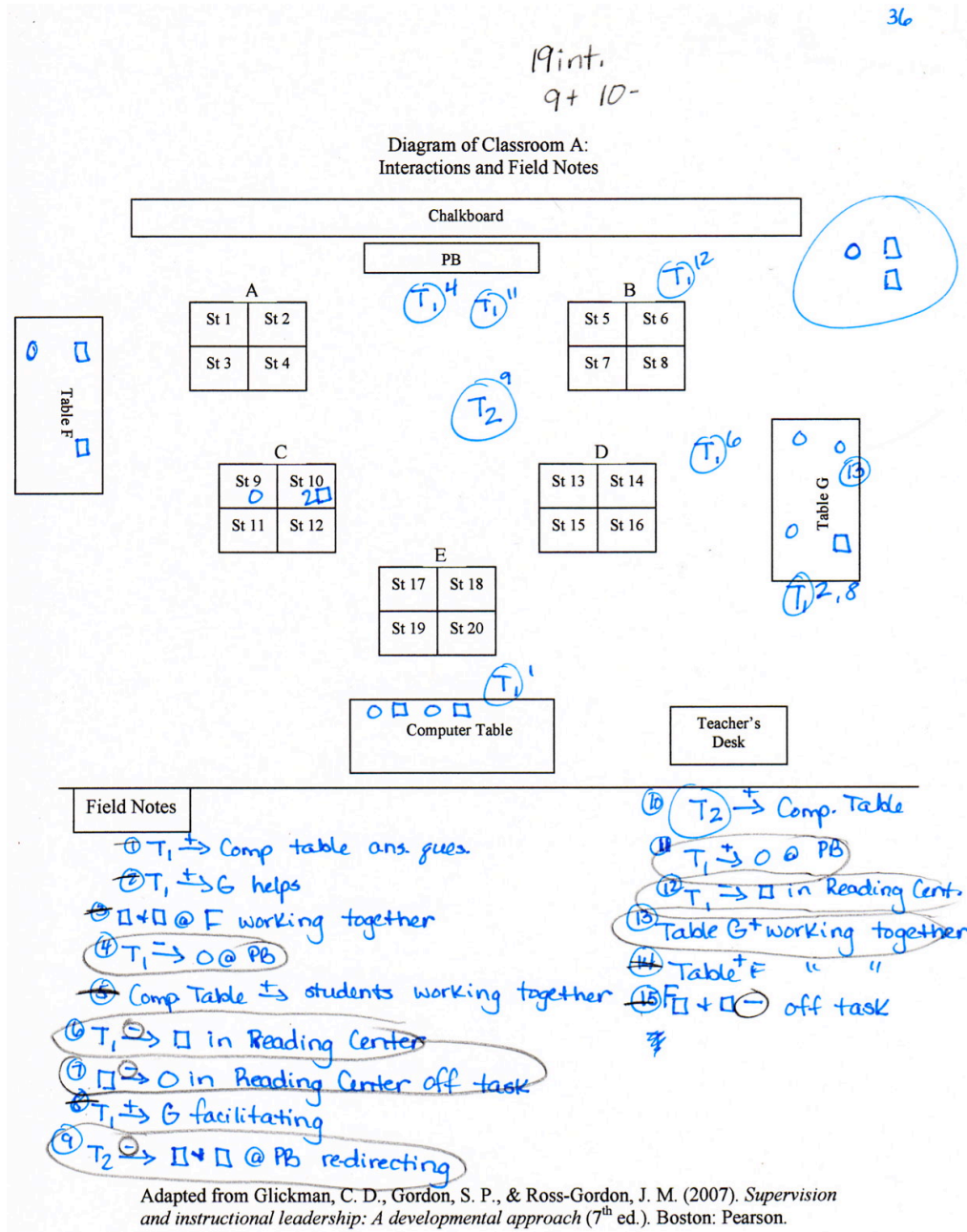
Figure 15. Data analysis on the Researcher copy of the Observation Diagram A.

Diagram of Classroom A:
Interactions and Field Notes
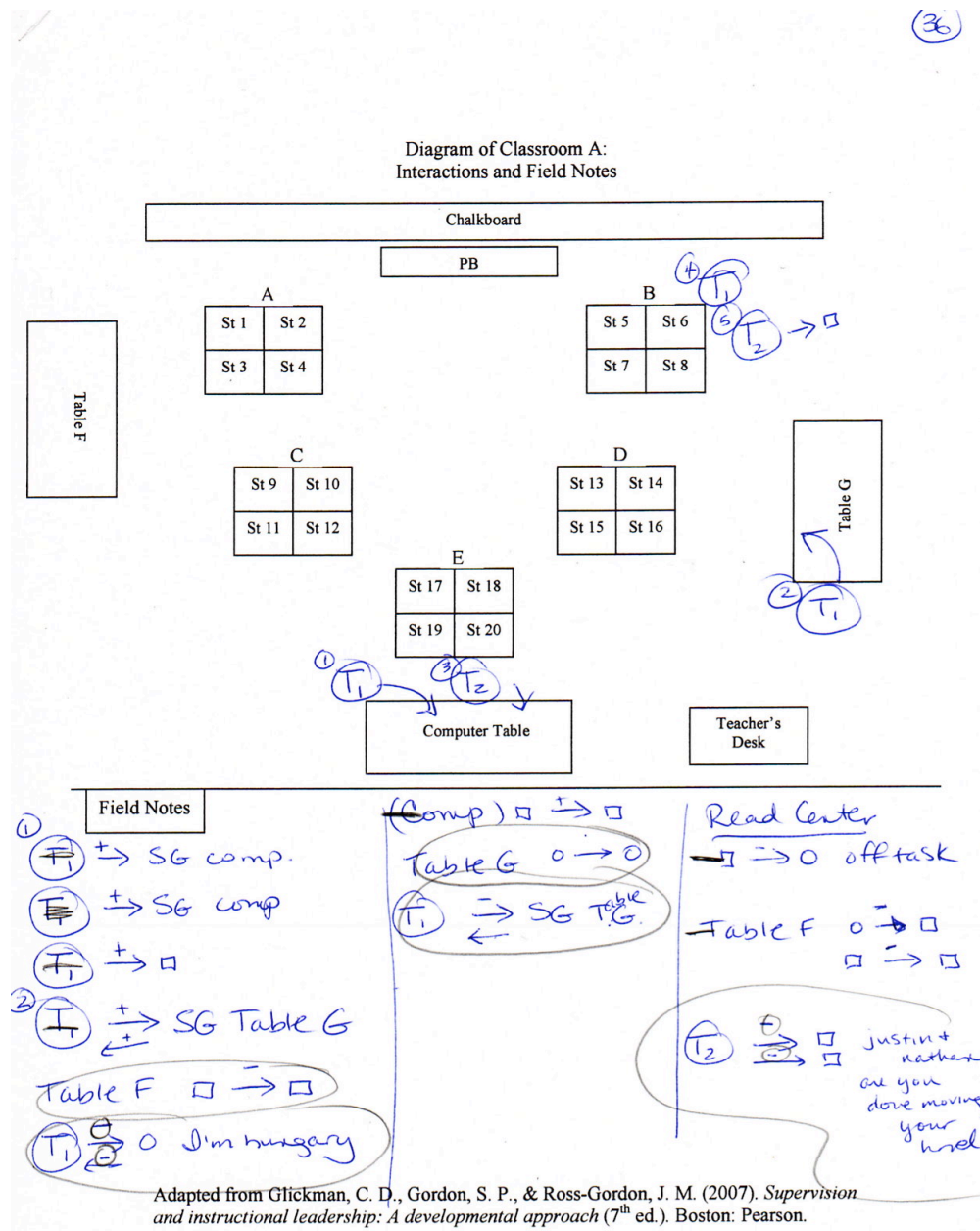
Figure 16. Data analysis on the Co-observer copy of the Observation Diagram A.

Another common thread that emerged from the coded interactions in all of the

classrooms was the occurrence of negative interactions. It was noted that, although they

occurred throughout the whole classroom, a majority of the negative interactions were

coded to the same individual student or group of students. For example, Figure 17

illustrates the interactions that took place during a whole group lesson in Michaela's classroom. During that five-minute segment portrayed in Figure 17, there were a total of 31 coded interactions, comprised of 19 positive and 12 negative interactions. Of those 12 negative interactions, five of them were with Student 8. Just within that five-minute segment alone, that student was coded for crying out in class, needing to be redirected on-task, and acting out in class. Similar instances occurred with individual students in the other three classrooms as well. From our observations it was clear that it only took the negative interactions of one student to affect the climate of the classroom negatively.

Adapted from Glickman, C. D., Gordon, S. P., & Ross-Gordon, J. M. (2007). *Supervision and instructional leadership: A developmental approach* (7th ed.). Boston: Pearson.
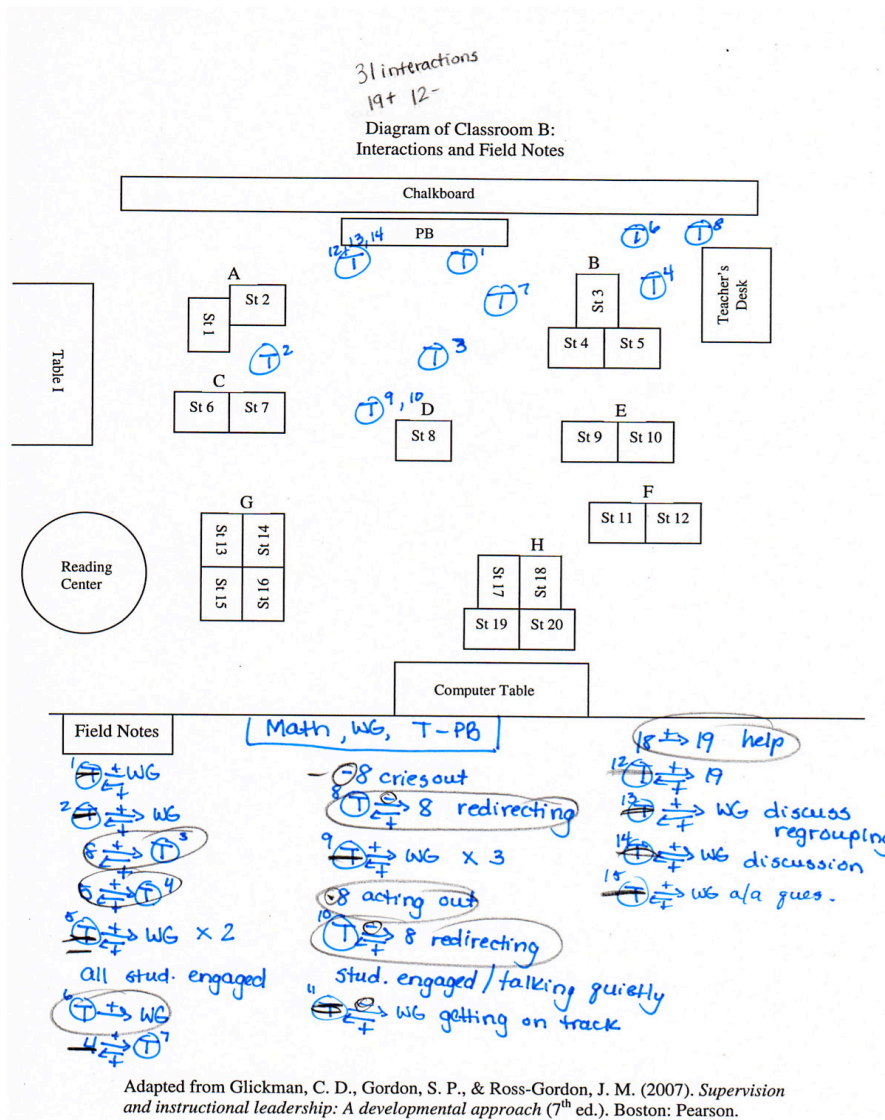
Figure 17. Multiple negative interactions with the same student.

In reviewing the interactions that were coded, Table 5 shows how many interactions took place during each observation. In addition, the total number of interactions was separated into the number of positive and negative interactions. Due to students switching classes, the total of interactions was separated into the different groups of students that were observed. Also looking at the total number of interactions coded

within each classroom, it is important to note that the number of interactions was greatest during the Reading and Language Arts block of time for each class. However, the time allotted to both these classes was also greater. This particular school district mandates that there be a 90-minute Reading and Language Arts block allotted for each grade level. Therefore, due to that being the longest segment of time for a particular subject, more interactions were coded during those subjects and with those particular students. Grade 3 students switched for Reading and Language Arts. Therefore, HR refers to the homeroom group of students and R/LA refers to the Reading and Language Arts group of students on Table 4. By contrast, Grade 5 students switched for core content classes. Each teacher was responsible for teaching Reading and Language Arts to their homeroom group of students. The labels H1, H2, and H3 refer to the different students observed in each of Cameron's History lessons, and the labels S1, S2, and S3 refer the different students observed in each of Jennifer's Science lessons. However, one of those core content lessons was taught to the individual teacher's homeroom group of students.

Table 5

Total Number of Interactions Coded in Each Classroom

Teacher	Group of Students	Students Observed	Total # of Interactions	Positive Interactions	(%)	Negative Interactions	(%)
Scarlet	HR	17	290	231	79.7%	59	20.3%
	R/LA	16	374	285	76.2%	89	23.8%
Total		33	664	516	77.7%	148	22.3%
Michaela	HR	17	453	370	81.7%	83	18.3%
	R/LA	19	336	292	86.9%	44	13.1%
Total		36	789	662	83.9%	127	16.1%

Cameron	HR	17	310	268	86.5%	42	13.5%
	H1	19	134	126	94.0%	8	6.0%
	H2	17	133	117	88.0%	16	12.0%
	H3	16	98	81	82.7%	17	17.3%
Total		69	675	592	88.7%	83	12.3%
Jennifer	HR	15	218	174	79.8%	44	20.2%
	S1	17	115	87	75.7%	28	24.3%
	S2	19	101	81	80.2%	20	19.8%
	S3	16	143	111	77.6%	32	22.4%
Total		67	577	453	78.5%	124	21.5%

In all four of the classes, a majority of the interactions observed were positive. In Grade 3, Scarlet had 516 (77.7%) positive interactions and 148 (22.3%) negative interactions, out of a total of 664 classroom interactions. Michaela was observed with having 662 (83.9%) positive interactions and 127 (16.1%) negative interactions out of a total of 789 classroom interactions. In Grade 5, Cameron had similar results with 592 (88.7%) positive interactions and 83 (12.3%) negative interactions out of 675 interactions total. Lastly, Jennifer was observed to have 453 (78.5%) positive interactions and 124 (21.5%) negative interactions out of a total of 577 classroom interactions. Looking at the percentages from each of the classroom observations, with class sizes ranging from 19 to 22 students, nearly 20% of all the interactions were negative in all four classrooms. However, as stated previously, several negative interactions were coded for the same individual or same group of students in each class. The greatest number of negative interactions occurred with the students in Scarlet's Reading and Language Arts class

(with 89 negative interactions) and Michaela's homeroom group of students (with 83 negative interactions). It is important to note that the same individual student coded with repeated negative interactions was present in both sets of students. Additionally, it is important to note that Scarlet's Reading and Language Arts class was comprised of those students labeled as "Title I" in Reading, in addition to those students who need remediation in Reading.

Classroom observation of instructional methods. In addition to the interactions, the type of instructional methods used within the classroom was coded as well. The instructional methods coded varied in relation to the instructional method used within the classroom. A wide variety of instructional methods were used in each of the classrooms observed. Table 6 indicates the type of instructional methods that were used with each different group of students within each classroom. Coding was used to indicate the presence of teachers building relationships and connecting culturally (CC) with students, instruction given in small groups (SG), individualization of instruction (I), and the use of technology (T) within instruction. For coding purposes, the code CC was used to indicate occurrences of teachers building relationships with students and connecting culturally with students. Each time CC was coded, my co-observer and I recorded what was taking place in our field notes. "Connecting culturally" and "individual instruction" were both coded for individual occurrences. "Small groups" and "technology" were coded based on whether they were used per lesson. Table 6 records the instructional methods used during the day of each teacher's observation. Since these data were generated in the course of

the same observations, the group breakdown is identical to that explained in relation to

Table 5.

Table 6

Instructional Methods Used During the Classroom Observations

Teacher	Group	CC	SG	I	T
Scarlet	HR	4	1	0	2
	R/LA	1	1	5	2
Total		5	2	5	4
Michaela	HR	3	2	1	2
	R/LA	1	1	5	2
Total		4	3	6	4
Cameron	HR	6	2	12	1
	H1	2	1	0	0
	H2	0	1	0	0
	H3	0	1	0	0
Total		8	5	12	1
Jennifer	HR	4	2	5	1
	S1	1	1	0	0
	S2	1	1	0	0
	S3	0	1	0	0
Total		6	5	5	1

Note. CC = Connecting Culturally, SG = Small Groups, I = Individualized Instruction, and T = Use of Technology.

Scarlet. Throughout the day, Scarlet used a variety of instructional methods.

Moreover, as discussed in Review of the Literature, those instructional methods were

those that have been proven to be most effective with at-risk student populations.

Connecting culturally and building relationships. Scarlet was observed building a personal relationship with individual students within her homeroom group of students on four separate occasions throughout the day. The story read during the Reading lesson was subsequently discussed by linking it to the students' backgrounds and prior knowledge.

Small group and individualized instruction. Small groups were used during the Mathematics lesson, as well as with the Reading group of students (R/LA). There were five different small groups used within the Reading lesson, and Scarlet provided instruction to each group of students based on the group's individual needs. Therefore, there were five different occurrences of individual instruction observed in Scarlet's classroom. Within those small groups, students were given hands-on activities to complete as well. The students were paired for an active learning game in Mathematics using dominoes. In Reading, students were sorting word cards, as well as creating flipbooks based on the narrative elements of the story they were reading.

Incorporating technology. In coding for technology, the Promethean Board was used during whole group instruction in the Mathematics, Language Arts and Reading lessons, in addition to a computer activity given during the small group portion of the Reading lesson. Thus, there were four different codes for technology being integrated into the lessons throughout the day's observation of Scarlet's classroom.

Michaela. The observation of Michaela's classroom yielded similar results. She too incorporated the best instructional methods for at-risk student populations in her classroom.

Connecting culturally and building relationships. There were three separate occurrences of building relationships with individual students within the homeroom group of students. Additionally, Michaela connected the story read during the Reading lesson to the students' prior knowledge and background, connecting them culturally to the story.

Small group instruction. Small groups were used during the Social Studies, Mathematics, and Reading lessons. During the small groups in each of those subjects, hands-on activities were used to engage students. The students participated in a map labeling activity within small groups in Social Studies. As seen in Scarlet's classroom observation, students were paired during the Mathematics lesson to play a game using dominoes, and were observed sorting word cards during the Reading lesson.

Individualized instruction and incorporating technology. While coding for individualization of instruction, Michaela was observed reading quiz questions aloud to a small group of students, providing individualized instruction based on each student's needs. In addition, there were four small groups that were observed during the Reading lesson, in which Michaela provided individualized instruction to each group of students based on the groups needs, as well as an Exceptional Education student using a program on the computer to meet his individual needs. In coding for technology, the Promethean Board was also used in Michaela's classroom during the Mathematics, Social Studies, and Reading lessons. The same Exceptional Education student that was coded for individual instruction on the computer was also coded for the use of technology, yielding

a total of four different occurrences of technology being integrated into classroom instruction for Michaela.

Cameron. There was a great difference from the findings in both the Grade 3 teachers in the coding for the instructional methods used Cameron's Grade 5 classroom. From the observations it was clear that the maturity level of the Grade 5 students allowed for more independent student work. The commonality between Grade 3 and Grade 5 was the use of several different instructional methods that are most effective with at-risk student populations.

Connecting culturally and building relationships. There were eight different occurrences of her connecting culturally with individual students throughout the day. Four of those codes occurred during the small groups used within the Reading lesson. Within the small groups during Reading, Cameron was using the story to connect with the students' own backgrounds, personal experiences, and prior knowledge. The other four CC codes occurred as Cameron was observed building personal relationships with individual students throughout the day.

Small group instruction. Small groups were used during Reading and Language Arts, as well as each of the three Social Studies groups (Group 1, Group 2, and Group 3). During those small groups in the Social Studies lessons, a hands-on activity was used to show the importance of the House of Burgesses, as well as provide the students with a visual organizer for the information they were learning.

Individualized instruction and incorporating technology. Individualized instruction was the instructional method used the most by Cameron. There were four

separate small groups that each met with her during Reading, in which the lesson was based on the group's needs. In conjunction with the small groups, students that were working independently were allowed to use the computer to take quizzes on books they had read in his or her own time, based on his or her own level of reading. Furthermore, Cameron conducted writing conferences with seven different individual students during Language Arts. During these conferences Cameron and the student worked together to edit a sample of the student's writing, and to discuss his or her individual strengths and weaknesses. Altogether, there were twelve separate occurrences of individualized instruction. The same code for the computers used for individualized instruction was also coded for the use of technology.

Jennifer. Where Cameron was unique with using individualized instruction the most, Jennifer was also unique in her use of hands-on activities in each of the lessons observed in her classroom. In addition, Jennifer uniformly used a variety of the best instructional methods for at-risk student populations.

Connecting culturally and building relationships. There were six separate occurrences of Jennifer building relationships with individual students throughout the day.

Small group instruction. In addition, Jennifer used hands-on activities for every lesson during the observation. Each of these hands-on lessons was incorporated into the small group activities that were observed. Small groups were incorporated into the Reading, Language Arts, and all three Science lessons. During the Language Arts lesson, the students were paired up with a partner to participate in a hands-on game involving the

use of prefixes and suffixes. Hands-on activities were also used in the small groups

during the Science lessons. Students were observing different types of rocks within his or

her small groups, as well as participating in an experimental activity that symbolized the

creation of metamorphic rocks.

Individualized instruction and incorporating technology. The groups that were

coded as small groups during the Reading lesson were also coded for individualization of

instruction. Each different small group met with the teacher, and the activities conducted

during these small groups were geared for each individual group's needs. In addition, one

small group activity during Reading involved a computer activity that was also coded for

the integration of technology.

As discussed in Review of the Literature, in addition to building relationships

with students, the use of small groups, individualized instruction, connecting culturally

with students, and computer-assisted instruction are the best practices to incorporate with

at-risk student populations. Each of the instructional methods was used in all four

classrooms. However, the method used most often was specific to each individual

teacher. The two most common among all four teachers were individualized instruction

(I) and connecting culturally (CC) with students. There was a stronger presence of

technology (T) observed in Scarlet and Michaela's classrooms. However, this was due to

having the Promethean Boards in their classrooms. Small groups were also incorporated

in all four of the classrooms. These were used in conjunction with providing

individualized instruction, as well as providing hands-on activities for the students to

engage in.

Summary of Classroom Observation Findings

In reviewing the results from the observations in all four classrooms, it would appear that the interactions that took place in the classroom drove the climate of the classroom, as well as the classroom management. For example, where it was observed that an individual student repeatedly caused negative interactions within the classroom, such with Michaela's classroom, the teacher had to stop instruction to address the student's off-task behavior. Additionally, during small group instruction and hands-on activities, as in Scarlet's Reading and Language Arts class and one of Jennifer's Science classes, the number of negative interactions increased, thus changing the climate of the classroom. In some cases, these negative interactions caused a cease in instruction, and even the activities themselves. More time was dedicated to addressing disruptive behaviors during those instances within the classroom. Therefore, the climate of the classrooms then drove the instructional methods that were being used. However, as reported earlier, the majority of the interactions were positive in all.

In addition, a variety of instructional methods were observed being used by each teacher. As discussed in the Review of the Literature, small group instruction, hands-on activities, individualized instruction, and incorporating technology are the most effective methods to use with at-risk student populations. Each of these methods was observed being used in each of the participating classrooms.

In review, for the most part the lessons in each classroom followed the same plan that was discussed during each phone interview conducted the evening prior. There were a few observed occasions where negative interactions cut small group activities short.

After each classroom observation was completed, the teachers participated in a face-to-face interview to discuss their own teaching experiences and perceptions on class size. The responses to the interview questions added more insight into the instructional methods that were used during the observations.

Interviews

Interview Protocol B. After the each classroom observation, the teachers engaged in answering open-ended interview questions. Each of the interviews took place in the participating teachers' classrooms. This was to ensure confidentiality, as well as to maintain a level of comfort and familiarity for the participants. Each interview took place in the afternoon of the same day on which the observations were conducted after all students had left for the day.

All interviews ranged between twenty to forty minutes in length and were voice-recorded for accuracy. Each participant was recorded willingly and responded openly to each question. The first interview was conducted on October 5, 2009 with Scarlet and lasted for thirty-five minutes. Scarlet had taught at a Title I school for seven years. She was quite upbeat and eager to answer the questions during the interview. The second interview was conducted on October 6, 2009 with Michaela and lasted for twenty-three minutes. She had taught for 5 years in Title I schools. Michaela was more laid back, but willing to share during the interview. The third interview was conducted on October 7, 2009 with Cameron and lasted for thirty-two minutes. Cameron had taught for 16 years in a Title I school. She also was very upbeat and eager to express her opinions and perceptions regarding class size at her school. The final interview was conducted on

October 8, 2009 with Jennifer, and it lasted for forty-five minutes. Jennifer had taught in Title I schools for 24 years and was more reserved during the interview and shy about being voice-recorded. As the interview progressed Jennifer became more relaxed in answering the questions.

After completion, each interview was transcribed verbatim. During each interview field notes were made describing the setting and overall feel of each interview. Member checking was conducted as each participant was given a copy of their individual transcribed interview to check for accuracy, as well as given the opportunity to make any changes in what they discussed. No changes were made.

Emergent themes. Inductive data analysis was used to code each transcribed interview for developing emergent themes. These themes were based on meaningful phrases shared by each interviewee in the interview responses. Looking at all four transcribed interviews, a total of 125 meaningful phrases were coded and identified (see Table 7).

Table 7

Units of Meaningful Data Coded from Transcribed Interviews

INFORMANT INTERVIEWED	UNITS
Scarlet	36
Michaela	26
Cameron	30
Jennifer	33
Total Data Units	125
Average Data Units Per Interview	31.25

After the meaningful phrases were coded, codes were grouped into themes. Twelve themes were established from the four transcribed interviews. These themes were then sorted into three categories: 1) demographics, 2) teaching experience, and 3) definitions of the ideal classroom. Table 8 shows the three categories and the twelve themes from the four interviews. The codes from each interview were then compared for duplicate or overlapping themes. In reviewing the overlapping themes, it was determined that the twelve themes were too broad. In the end, five different themes emerged from the code categories: 1) Title I Student Needs, 2) Building Relationships, 3) Interactions, 4) Classroom Climate, and 5) Instruction. Coded responses that created these five emergent themes were embedded in each of the twelve themes in Table 8. For example, responses regarding Title I student needs were found in "Type of students serviced," "Characteristics of most difficult year taught," "Student behavior," "Student achievement," and "Class size" themes.

Table 8

Categories and Themes of Coded Interview Responses

Category	Themes
Demographics	Own educational experiences Class size experienced growing up
Teaching Experience	Years of Teaching Teaching settings Type of students serviced Characteristics of most difficult year taught Characteristics of most enjoyable year taught

Definitions of the ideal classroom	Student behavior Student achievement Teacher benefits Student benefits Class size

Each interviewee made several comments coded for each emergent theme. Table 9 illustrates how many meaningful phrases each interviewee shared during interview responses within each of the five emergent themes.

Table 9

Number of Coded Phrases Within Each Emergent Theme

		Emergent Themes				
Interviewee		Student Needs	Building Relationships	Classroom Interactions	Classroom Climate	Classroom Instruction
Scarlet		10	2	3	10	8
Michaela		8	1	3	7	5
Cameron		8	3	3	8	6
Jennifer		8	2	3	8	6
	Total	34	8	13	33	25

Title I student needs. After reviewing the coded phrases from each interview, it was clear that all four informants answered several questions similarly. In discussing the different aspects of class size, the dominant theme that was clear through all interview responses was the needs of Title I students. Scarlet, Michaela, Cameron, and Jennifer

discussed the needs of Title I students throughout the whole interview. All three of

academic, social, and basic needs of the students were addressed in all four interviews. In

terms of academic needs, each teacher asserted that their classrooms were comprised of

multi-level learners, with a majority of students being just below grade level or on grade

level. Those multi-level learners were also comprised of ESL and Exceptional Education

students. Typically, the level of learners within the Title I class was described as being

low, or very "needy" among all four interviewees. Moreover, it was discussed that the

academic readiness of Title I students was affected by the students' basic needs. Scarlet

best explained the difficulties that challenge Title I students, causing them to be "needy,"

in conjunction with the affects of class size when she stated:

> Obviously, we are a Title I school for a reason. You know? You've got the …
> economic issue. … [The students] just don't have the background experience, I
> guess, or the support, maybe, at home. … I've heard people say this, and I'm
> probably guilty of it too – saying, 'I'm the *only one* helping this child. There's no
> one at home.' … And I'm not blaming anyone at home. They've got a second job
> – you know, [they have to] make end's meet there. So, you know, obviously their
> biggest priority is getting food on the table, at that point. … That's why their
> kids go to school – that's what the parents will say, 'that's why my child goes to
> school, so they'll learn from you. That's your job!' So, it *is* my job to do that, and
> it makes it really difficult if I've got 25 kids in my room… (Scarlet)

Additionally, all four interviewees discussed at great length that the academic

needs of the Title I students in the classroom greatly affected the pedagogical decisions

they made. Cameron delivered that message the best when she explained:

> Things that affect the way I teach are how ready the kids are for their work. I
> don't really mean academically ready. I mean do they come in fed? Do they come
> in clean? Do they come in ready to learn? Uh, can I just teach? … So their – their
> social readiness for school affects a lot of the way I do things. And of course their
> academic readiness affects what you do – how fast you can move, whether you
> can have small groups – because they have to be able to work independently for
> you to have small groups. If they can't handle being independent workers, then I

can't do small groups. So, training them to work that way sometimes takes a long time, and you end up with more whole group instruction. (Cameron)

In this emergent theme of Title I student needs, it was clearly expressed by each of the interviewees that class size was a major factor to consider when teaching students in Title I schools. The students have several needs that have to be met academically and socially. Additionally, this was discussed as being a great challenge among the interviewees when they were faced with large class sizes.

Building relationships. In relation to the student needs of Title I students, the importance of building relationships with students was another theme that emerged from each of the interviews. This theme was prevalent as each interviewee discussed aspects of one of the most enjoyable years of their teaching experience. Another aspect of those enjoyable years was smaller class sizes. Smaller class sizes ranged from 13 students to 19 students. Building relationships with students was easier, as there were fewer students. More time could be devoted to each individual student. Cameron took the opportunity to discuss the benefits of building a relationship with students that she had experienced and the affect it had on student learning. She explained that it was important to consider:

> Have [the students] *had* a good experience in school? …Last year, I had five or six students who would swear they never had a teacher that liked them – who had never had a good year in school. And, I don't mind having those kids. I often will ask for those kids. I would prefer to spend six or eight weeks getting those kids on my side – where they know I care about them. And maybe we're not moving as fast academically, but by the end of the year they work their butts off because they're just *happier*. (Cameron)

Additionally the interviewees discussed that building relationships with students was important, as these teacher-student relationships may be among the few relationships with adults the students know. Again class size was a factor in that larger class sizes, of

20 or more students, made it difficult to build relationships with students. Jennifer gave a heartfelt response to the same question regarding the importance of opportunities for building relationships with students due to the needs of the student population in Title I schools. She explained:

> In our school, these children – and this kind of makes me teary eyed – need us. They go home to parents that work two jobs, big brothers or sisters are taking care of them, or they go home in 5th grade and just open a key to a door and go inside to no one. Sometimes we're the only way they get food, we're the only people that pay attention to them, and having a large class size – where I can't do that – just tears me apart! I want to be able to say …'I love you!' No one says that. No one wants to hear what [the students] have to say. …I feel sorry for these children. Sometimes we're the only person in their life – the only place where they get food. A lot of times I keep my bottom drawer with Pop-Tarts and stuff in them, because I have to. …You know, and parents send them off to the bus, and they don't have a snack, they don't have this, they don't have that – and, for the most part, [the students] are real appreciative. And having big class sizes – you can't be – their mom, their person in their life, because you're so busy juggling the fruits! (Jennifer)

Classroom interactions. While coding and analyzing interview responses, the topic of classroom interactions was found in the responses of each participant when discussing classroom instruction, classroom management, pedagogical decisions, and classroom climate. In particular, the participants discussed how the ability to interact with students affected how well they were able to meet students' needs. Each interviewee addressed the importance of classroom interactions within Title I schools. While addressing the interactions that could take place in the ideal class size, Scarlet shared:

> The perfect sized classroom, I would say…if I could have it my way - I would say 12 … 12 kids would be great. Based on their needs, here at this school in particular, to be able to reach every child, to have time to go and assist every child while they're doing independent work, or when they're doing collaborative learning… just the environment when you have a smaller group- it kind [of] feels more like a family instead of a lecture hall…It's more personable, they get more opportunities to speak – to ask their questions, for me to identify their needs–and

it's easier to work with small groups as well…How nice [would it] be to have 3 groups of 4?...[When the class size is small, you] get to know [them] one on one - because obviously when you get to know the kids… you're able to meet their needs, be able to focus on [them] and really dig down into their background knowledge – their strengths, their weaknesses, and their learning style …(Scarlet)

Cameron defined an ideal class size as one with 18 students. Within that ideal size class, Cameron suggested:

[The interactions would be] Personal. Uh, where you know the child, you know what they are interested in personally and outside of school, so that you can bring that into their…academic world – so that you can make their lessons relevant somehow – someway – to what they do outside of school – that they find interesting. And that is *much* easier to do with fewer students. You know who does ballet, you know who does football, you know who does roller-skating – and you can find books and topics and extend the math in more ways related to them personally. I think that *that* interaction is when you know them well, and you can relate their schoolwork to their personal interests. (Cameron)

Each of the participants also discussed how classroom interactions were affected by class sizes that they considered to be too large. When class sizes were too large, classroom interactions became more negative and occurred less often. The participants discussed:

[In a class with too many students] it's very hard to do [have interactions] one-on-one. I think some of it may be hit-or-miss – you might help some students one day…and your students that are pretty good you probably end up ignoring because there are others that are in more need. So, it's harder to get to know the students better with a larger class size. And it's harder to meet the students' needs with a larger class size. (Michaela)

Also in regards to the interactions in a class that was considered to be too large, Jennifer shared:

The kids that are shy, or don't talk much, will get no attention. The kids that are

upper levels seem to always get pushed on the kids that are low leveled, and

they're being the teacher – trying to help them – instead of the teacher putting her

hand in it. (Jennifer)

As coded in this theme, each of the interviewees explained that class size had an

inverse effect on classroom interactions. The fewer the students in a class, the more

enriched interactions could take place within a Title I classroom. Conversely, the more

students in a classroom, the fewer and less meaningful interactions could take place.

Classroom climate. Classroom climate (defined as the atmosphere of the

classroom based on a wide range of merging variables: (a) teacher concern, punitiveness,

authoritarianism, favoritism, enthusiasm, and clarity; (b) student decision-making, peer

attitudes, competitiveness, and satisfaction; (c) classroom physical appearance; and (d)

instructional practices (Engstrom, 1981)) was another theme that emerged from the

interview responses. However, the discussion of the classroom climate coincided with the

discussion of classroom management (defined as those managerial behaviors and

methods used within the classroom related to the maintenance of on-task student

behaviors and the reduction of off-task or disruptive student behaviors (Vasa, S. F.,

1984)) in each of the interviews. The two concepts were intermingled in the interview

responses. According to each of the interviewees, the climate and management of the

classroom indistinguishable from one another, in all class sizes. When discussing their

ideal class size, they described the classroom climate in more positive terms, such as

"calm" or "respectful." For example, in Scarlet's ideal class size, the classroom climate was described as:

> one of respect where…they aren't inhibited in their insecurities. I guess, or if they have a question, they feel free to raise their hand and…wait to be called on to ask their question without fear of judgement …They understand how to talk to one another. They understand that I have respect for them, and they have respect for me – and it's a two-way street type of deal. (Scarlet)

Michaela suggested that:

> I think it would be a little calmer. I don't necessarily…even though I have higher numbers, and it's challenging, I still feel like it's positive. I think it would be *even more* positive and inviting…I think it would be easier to get the students to interact better and control bullying and behavior with smaller numbers. (Michaela)

The discussion of classroom climate changed when interviewees were discussing large class sizes. Terms such as "crowded," "unsafe," "chaotic," and "on edge" were used to describe the classroom climate in large class sizes. While discussing classroom climate in a class that she considered to be too large, Scarlet explained:

> A classroom with too many students obviously is – number one, it's crowded. So, you've already got it uncomfortable. …When you're uncomfortable you can't even… talk to somebody – how are you supposed to learn when you are uncomfortable? You know? I mean, when you're not…in a safe environment, you [have] too many kids, it's overcrowded, you're not [going to] be able to hear the

teacher because you've got kids all the way in the back of the room… then you've

got behavior management issues. … I would say just chaotic. (Scarlet)

Michaela proposed that:

> I feel like it would be not as relaxing. A lot of high energy I feel like, because
>
> even though you try not to, I would think that you as the teacher are frustrated and
>
> flustered, and that feeds off on the kids, because there's not enough of you and
>
> there's a lot of them, and they're needy anyway because they're in a Title I
>
> school. [It would be] so frustrating and high energy…I think if somebody walked
>
> in, they'd just kind of feel on edge and kind of out of place. (Michaela)

Jennifer summed up her perceptions in a word:

> Tense! That says it right there. Tense for the teacher, tense for those little kids that
>
> are waiting for somebody to explode, tense because they can't raise their hand
>
> because the teacher's too busy dealing with this and dealing with that, and…
>
> Tense! (Jennifer)

In this emergent theme, the terms classroom climate and classroom management

were used interchangeably. As described by the interviewees, the management of the

classroom was an integral part of the classroom climate. Managing student behaviors was

regarded as being part of the decision-making process within the classroom by each of

the interviewees. They perceived that with larger class sizes, more off-task and disruptive

student behaviors that needed to be addressed were present. Thus, these unruly behaviors

offset the classroom climate, creating a more stressful classroom environment.

Conversely, their ideal class sizes were perceived to have fewer behavior-management issues. As such, the classroom climate was perceived to be more inviting.

Classroom instruction. Next to Title I students' needs, of all of the aspects associated with class size, the theme of classroom instruction was the most prevalent, and most widely discussed during the interview responses. Class size was perceived again to have an inverse relationship on the level and type of instruction conducted within the Title I classroom. As discussed by all interviewees, instruction was altered or curtailed in large class sizes. Additionally, different instructional strategies were implemented to accommodate large class sizes. In discussing her most difficult year in teaching, Michaela responded that student behaviors and large class size were contributing factors, and instruction was affected. She expressed:

> I had a lot of the different ranges of students, similar to this year. But I also had
> with the different ranges, different behavior problems. [There were] lots of
> behavior charts and management issues…and the numbers [in regards to class
> size] were 22. There were behavior problems, low students, high ESL. Instruction
> was kind of curtailed, and it was spent more on behavior and manners and
> survival. (Michaela)

Additionally, Michaela gave an explanation for why instructional methods changed in large class sizes. She stated:

> In just using my experience last year, since it was the highest number and the
> most challenging, we had to do a lot of whole group – because the more engaging
> activities and the more hands-on activities would get out of control. It would get

too crazy. You couldn't really do centers, unless they were pairs, but even pairs

there's not enough room for the pairs to have spread out. So, it was really

different because of size. (Michaela)

Cameron also discussed how during one of her most difficult years in teaching,

the large class size affected the types of instructional methods she could utilize within her

classroom. She explained:

> I was in a different trailer – a singlewide trailer – and I had 28 students. We
> *couldn't* do groups because we didn't have room to move. Uh, we couldn't do
> Reader's Theater because we didn't have room to stand in front of the class. We
> pretty much just sat in our desks and had whole group instruction, unless we sat
> outside. And it was partly the size of the room – partly the number of the kids.
> You don't assign the same kind of work when you have a large class, because you
> can't grade it all. You don't want to read journal after journal after journal after
> journal every night when there's 28 of [them]. (Cameron)

In discussing the ideal classroom, all interviewees indicated that more small

groups could be incorporated into the instruction, as well as hands-on activities. Each

teacher expressed she could devote more time to individual students' needs in small class

sizes. Michaela explained that in the ideal class size of 16 students, there would be more

opportunity to implement a greater variety of ways to deliver instruction. She explained:

I could do a lot more, learning centers-small group activities, where the students

are more into groups and we do rotations. That works better with smaller numbers

than with larger numbers, where [there are] more students working together. …

Technology works a little bit better when you have fewer numbers, [because] you

have less students to try and hit being one person – trying to problem solve…

pretty much anything, I feel [it] would be easier with smaller numbers because

there's a little bit more of you to go around because there's less students.

(Michaela)

As discussed by all four interviewees, the class size determined what type of instruction was conducted within the classroom. As their perceptions indicated, large classes allowed for more whole group instruction and less small group, and individualized instruction. Hands-on activities were assigned less often, or conducted in a whole group setting, rather than within small group settings. These activities were conducted as more of a presentation to the whole class rather than the students completing the activities on their own. However, in smaller class sizes, the interviewees explained that it was easier to incorporate small group and individualized instruction, cooperative learning activities, hands-on activities, and technology into daily learning within the classroom.

Summary of Teacher Interview Findings

In summary, interview responses from all four interviewees indicated class size was the perceived controlling influence that affected all aspects within the classroom. Class size was persistently mentioned throughout all interview responses, as this was the common thread among all five of the emergent themes in data. In reviewing the meaningful phrases that were coded, it was clear that each emergent theme was closely related, dependent of class size and cyclical. The coded interview responses indicated that small classes were desired by the participants due to the challenges of student needs in Title I schools. Due to the great needs of the students in Title I schools, it was important to build relationships with the students. However, in order to build relationships, teachers needed to be able to interact with students. Yet, as perceived by the participating

teachers, the ability to interact with students was affected by the class size. The interactions that were able to occur within the classroom set the overall tone for the classroom climate. The classroom climate and class size, in turn, were the catalyst for the classroom instruction. Finally, the themes returned full-circle as the classroom instruction was based on the students' needs. Each of the interviewees commented the most on the student needs of the Title I student population. Moreover, the interviewees discussed what the ideal class size would be for Title students if they were to be enabled to meet those needs. The ideal class size differed among the interviewees. The ideal class sizes identified among the interviewees ranged from 12 to 18 students in class. Table 10 shows the ideal class size, as defined by each interviewee.

Table 10

Ideal Class Size Defined by Each Interviewee

Interviewee	Ideal Class Size
Scarlet	12 students
Michaela	16 students
Cameron	18 students
Jennifer	18 students

Data Synthesis

In comparison to the ideal class sizes as indicated during the interviews, the class sizes that were observed during the observations were slightly larger, with a range of 19 to 22 students in a classroom. During each classroom observation, each observed teacher

used several instructional methods, including small groups. However, more negative interactions were observed during the small group activities, as seen in Scarlet's Reading and Language Arts class and Jennifer's Science class. Moreover, it is important to note that the negative interactions coded during the small group activities occurred with the same individual student or group of students repeatedly. It was clear that just one individual student could affect the climate of the classroom, as seen with the same individual student in Michaela's homeroom group of students and Scarlet's Reading and Language Arts class. As the negative interactions increased during those observed instructional times in the class sizes of 19 to 22 students, it would stand to support the interviewees' perceptions that the use of small groups, hands-on activities, and individualized instruction would increase in difficulty as class size increased. Also noted, interactions that were coded for connecting culturally and personally with students occurred more often first thing in the morning and during times of transition. This appeared to be manageable during the observations in the class sizes observed. However, as the interactions of connecting personally with students decreased in number as more students arrived for the day, it is plausible that these interactions would become increasingly difficult to conduct with more students in a classroom.

In reviewing the observation codes and the emergent themes from the interview responses, there was one common thread throughout all of them regarding the affects of class size: student learning. Pedagogical decisions, classroom management, classroom climate, and classroom interactions were all affected by class size, according to interview responses, and as observed within the classroom observations. Additionally, all

participants asserted that those same aspects of the classroom affected student achievement. In an effort to generalize the findings from the case study to the other Title I elementary schools in the same district, the emergent themes in the data coded from the transcribed interviews were used to create survey questions. This survey was then utilized during the second phase of this study.

Phase II: Quantitative

The quantitative phase of the study served a twofold purpose. First, the survey created from the findings of the qualitative phase was conducted in an effort to generalize the finding from the one case study school to the other Title I elementary schools in the same school district. The second purpose was to explore whether the teachers' perceived affects of class size was detectable by official measures of student achievement.

Teacher Perception Survey

Derived from the inductive data analysis conducted on the responses from the interview phase, the themes that emerged from the data were used to create several different survey questions. The survey questions (see Appendix I for the full survey as conducted) were grouped into three sections: demographic information, preferred class size, and scenario questions, as shown in Table 11. There were a total of 17 questions in all. The first seven questions were presented in a combination of closed and open form items. Question 8 through Question 17 was scenario based, providing two different scenarios of class size within a Title I school. Based on smaller class sizes reported during interview responses, the first scenario was based on a class size of 15 students to represent a smaller class size. The second scenario was based on a class size of 25

students to represent a larger class size. Using a Likert-scale ranging from Strongly Agree

(5), Agree (4), Neither Agree nor Disagree (3), Disagree (2), to Strongly Disagree (1),

respondents were asked to circle the option on the scale that best reflected how strongly

they agreed with the statement given in each of the scenario questions. The survey was

then given to members of the Research and Planning Department and of the district's

School Administration Office and the district's Title I Coordinator for expert review.

Table 11 provides a list of each interview question.

Table 11

Teacher Perception Survey Questions

Question Number	Survey Question
1	How many years of teaching experience do you have?
2	How many years have you taught in a **Title I school**?
3	What grade level do you teach?
4	Gender
5	What would be an **optimal** sized classroom at a Title I school?
6	What would be an **unfavorable** sized classroom at a Title I school?
7	How many students do you currently have in your classroom?
8	How strongly do you agree that you would be able to connect on a personal level with each student in a class size of **15 students**?
9	How strongly do you agree that you would be able to individualize instruction for each student's needs in a class size of **15 students**?
10	How strongly do you agree that you would be able to use small groups in your instruction in a class size of **15 students?**
11	How strongly do you agree that more time is spent on instruction rather than discipline in a class size of **15 students**?
12	How strongly do you agree that you could incorporate the use of computers and technology into your instruction with a class of **15 students**?
13-17	Repeat of questions 8 – 12 using the example of **25 students** in a class.

Pilot study. Before the survey was distributed to the larger population, it was first pilot tested on the four participating teachers from the case study. This pilot test served to ensure the face-validity of the survey with the intended participants. Based on how each teacher responded to each of the survey questions, the results from the pilot test were congruent to the teachers' interview responses coded during the first phase of the study. In reviewing the survey responses to questions pertaining class size, the answers matched the information indicated in the teachers' interview responses. For example, on Question 5, one teacher chose the "12-15 students" option, and the other three teachers chose the "16-19 students" option. These responses were congruent to the defined ideal class size stated during the interview phase. The greatest difference among survey responses with the pilot test group pertained to question 17 regarding the incorporation of technology into daily instruction in a class of 25 students. However, the observation conducted in each of the respondents' classrooms provided an explanation for this difference. Of the four respondents in the pilot study of the survey, two had the Promethean Board technology in their classroom and were able to incorporate technology into daily instruction. Both selected the option Neither Agree or Disagree to that scenario question, while the other two pilot study respondents both answered Strongly Disagree. The rest of the survey responses were congruent with the findings from the teacher interviews.

Summary of Full Survey Findings

Access to the population. The purpose of the survey was to generalize the findings from the Title I teacher perceptions gathered in the interview phase to the other 18 Title I schools in the same school district. However, prior to distributing the survey to

the teachers, the school administrators at each school had to approve the school's participation. A letter was mailed the last week of January, 2010 to the administrators of each Title I school in the school district, seeking permission to distribute the survey to their teaching staff (see Appendix J). Within the letter, each administrator was asked to indicate whether he/she approved the distribution of the survey by phone or email by February 8, 2010. Due to inclement weather, the schools were closed on that deadline date, and only three school administrators had approved participation for their school. A follow-up email (see Appendix P) was then sent to each of the Title I school administrators, and phone calls were made to their office. Out of the 19 total Title I schools in the school district (including the case study school, however only individuals who taught in grade levels other than Grade 3 and Grade 5), only eight schools' administrators agreed to allow their teaching staff to participate in the survey. This corresponded to a participation rate of 42%.

Survey sample. To further the generalization of the findings, teachers in all grade levels were invited to participate in the survey. A total of 292 surveys were sent to every teacher at the eight participating Title I schools. Included with the survey was a cover letter explaining the purpose of the survey (see Appendix K), and a self-addressed envelope with postage provided. Of the 292 surveys that were distributed among the participating Title I schools, 116 surveys were completed and returned. This corresponded to a return rate of 40%.

The survey was sent out to all teachers within the eight participating Title I schools, including resource teachers, such as Music, Physical Education, Art, Librarians,

and Instructional Support staff. All teachers were included because they conduct lessons

with whole classes of Title I students as well. . When asked of their position, respondents

answered with an open-form item question indicating what he/she taught. These were

indicated as an Other category during coding. Table 12 illustrates the frequency

distribution of surveys.

Table 12

Frequency Distribution of Survey Respondents

Grade Level		Frequency	Percent
Kindergarten		18	15.5
Grade 1		16	13.8
Grade 2		13	11.2
Grade 3		13	11.2
Grade 4		15	12.9
Grade 5		12	10.3
Other		28	24.1
Total		115	99.1
Missing	System	1	.9
Total		116	100.0

Since the purpose of the survey was to generalize the findings of the case study to

the classroom teachers in Title I elementary schools, the specialist teachers' responses

were not considered. Upon filtering out those cases, the sample number dropped from 116 to 87 respondents, or 30% of the 292 distributed surveys.

Data analysis of the surveys. A frequency distribution and descriptive statistical analyses were conducted on each of the survey questions. A majority of the respondents had fewer than 10 years of teaching experience in a Title I school, as well as teaching experience all together. Figure 18 depicts the frequency distribution of the teaching experience of the K-5 respondents. Additionally, Figure 19 depicts the frequency distribution of the Title I experience of the K-5 survey respondents.
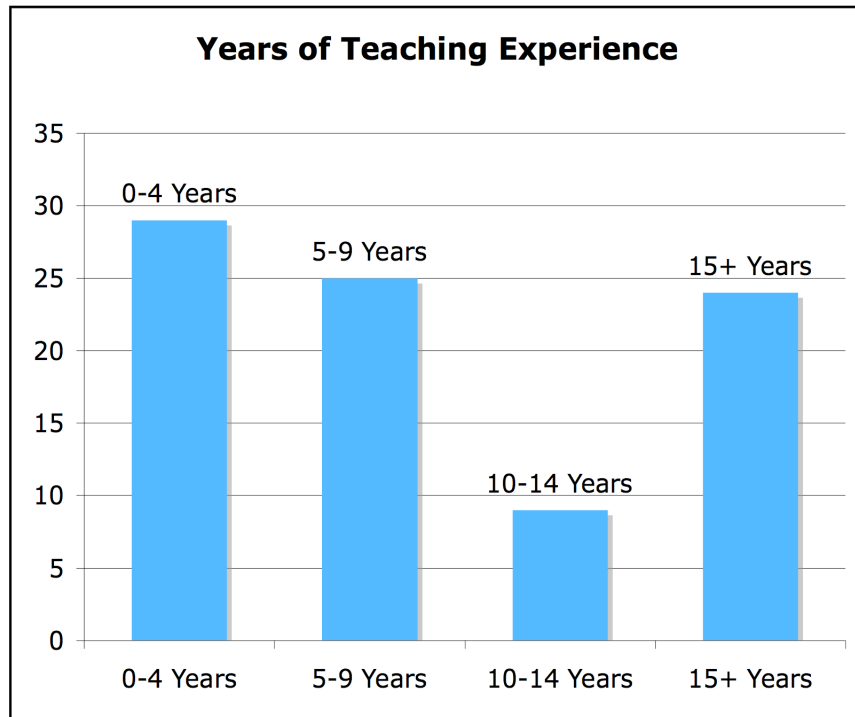
Figure 18. Bar Graph depicting the frequency distribution of teaching experience among survey respondents.
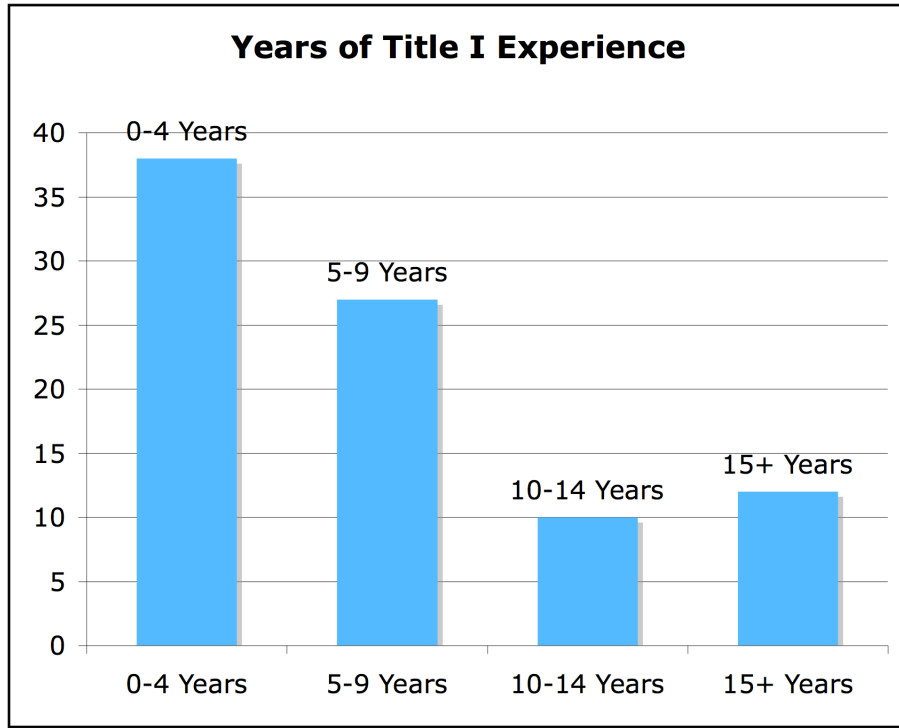
Figure 19. Bar Graph depicting the years of Title I experience among K-5 survey respondents.

Out of 87 total classroom teachers, there was only one male respondent. With respect to the perception of what an optimal class size and an unfavorable class size would be, the class size options for each of these questions were derived from the interview responses during the first phase of this study. Hence, in Question 5 of the survey, respondents were asked to choose one option between 12-15 students, 16-19 students, 20-23 students, 24-27 students, and 28-30 students for an Optimal Class Size. When coding these survey responses into SPSS, each class size option was given a nominal value ranging from one (12-15 students) through five (28-30 students). Table 13 depicts the frequency of survey responses regarding optimal class sizes.

Table 13

Survey Responses for Optimal Class Size

Class Size	Frequency	(%)
12-15 Students	43	49.4%
16-19 Students	43	49.4%
20-23 Students	1	1.1%
24-27 Students	0	0.0%
28-30 Students	0	0.0%
Total	87	100.0%

Question 6 of the survey asked respondents to select all options that applied in terms of Unfavorable Class Sizes, as requested by the Research and Planning department of the school district. The same class size options were given as in Question 5, however respondents chose more than one option. Table 14 shows the frequency for each Unfavorable Class Size option chosen.

Table 14

Survey Responses for Unfavorable Class Sizes

	Frequency	
Class Size	f	(%)
12-15 Students	1	1.1%
16-19 Students	6	6.9%
20-23 Students	53	60.9%

24-27 Students	81	93.1%
28-30 Students	73	83.9%

While coding the responses for Question 6 on the survey, it was observed that some respondents only checked one option from the Unfavorable Class Size categories. For example, 93.1 % of all respondents chose "24-27 Students" as an unfavorable class size, compared to the only 83.9% that chose "28-30 Students" as an unfavorable class size. It would be plausible to deduct that those same respondents that chose "24-27 Students" would also view "28-30 Students" as an unfavorable class size as well.

Question 7 on the survey was an open form question, asking the respondents to share how many students they were currently teaching. Current class sizes of the respondents ranged between 14 and 25 students. The most frequently reported class size (16.1%) 20 students. Figure 20 illustrates the frequency distribution of the class sizes of the respondents.
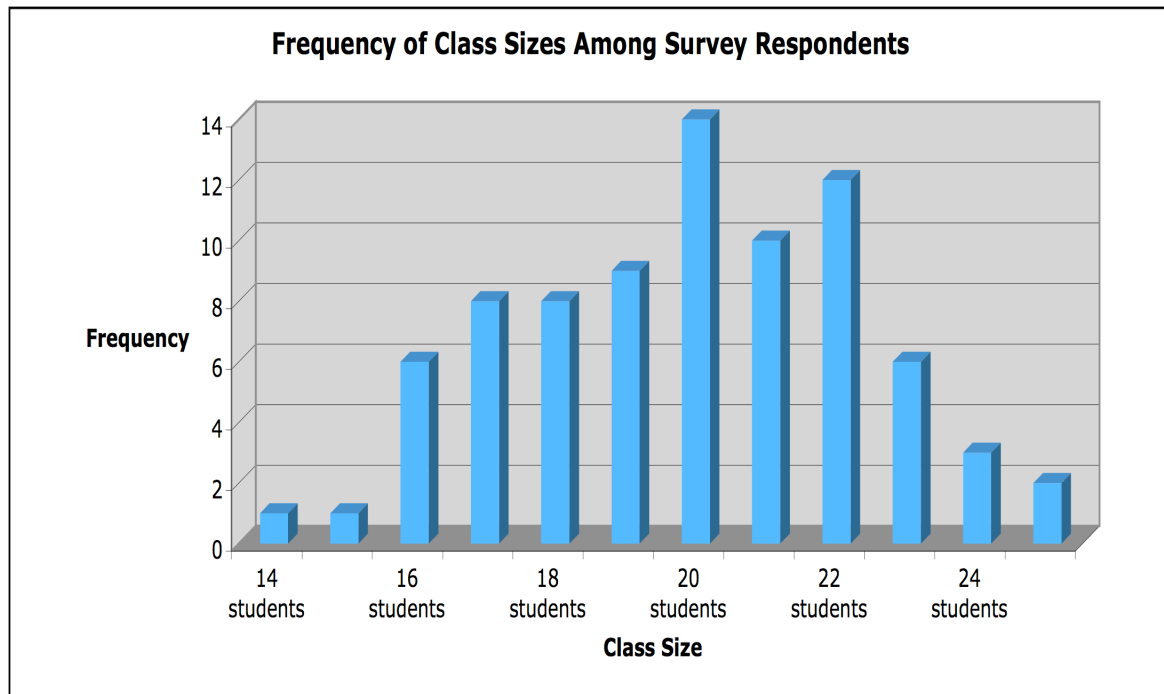
Figure 20. Frequency distribution of class sizes among the survey respondents.

The remaining survey questions pertained to two separate class size scenarios. The respondents were asked to select the option that best expressed how strongly they agreed to the statements provided. The first set of scenario questions dealt with a class size of 15 students and how it related to: 1) connecting personally with students, 2) individualizing instruction, 3) incorporating small groups in instruction, 4) time spent on instruction vs. discipline, and 5) incorporating computers and technology into instruction. These same five questions were then asked for a class size of 25 students. For both class size scenarios, the respondents were given Liker-scale options ranging from Strongly Agree (5), Agree (4), Neither Agree nor Disagree (3), Disagree (2) to Strongly Disagree (1). Table 15 provides the frequency distribution to the survey responses regarding the

class size of 15 students scenario questions. Additionally, Table 16 provides the same

frequency distribution for the class size of 25 students scenario questions.

Table 15

Frequency Distribution of Responses to the Class Size of 15 Students Scenario Questions

	Strongly Agree	Agree	Neither Agree or Disagree	Disagree	Strongly Disagree
Question	f (%)	f (%)	f (%)	f (%)	f (%)
8. How strongly do you agree that you would be able to connect on a personal level with each student in a class size of **15 students**?	71 (81.6)	15 (17.2)	1 (1.1)	0 (0.0)	0 (0.0)
9. How strongly do you agree that you would be able to individualize instruction for each student's needs in a class size of **15 students**?	55 (63.2)	26 (29.9)	3 (3.4)	3 (3.4)	0 (0.0)
10. How strongly do you agree that you would be able to use small groups in your instruction in a class size of **15 students?**	72 (82.8)	14 (16.1)	1 (1.1)	0 (0.0)	0 (0.0)
11. How strongly do you agree that more time is spent on instruction rather than discipline in a class size of **15 students**?	52 (59.8)	21 (24.1)	12 (13.8)	0 (0.0)	2 (2.3)
12. How strongly do you agree that you could incorporate the use of computers and technology into your instruction with a class of **15 students**?	60 (69.0)	24 (27.6)	1 (1.1)	2 (2.3)	0 (0.0)

Table 16

Frequency Distribution of Responses to the Class Size of 25 Students Scenario Questions

Question	Strongly Agree f (%)	Agree f (%)	Neither Agree or Disagree f (%)	Disagree f (%)	Strongly Disagree f (%)
13. How strongly do you agree that you would be able to connect on a personal level with each student in a class size of **25 students**?	1 (1.1)	24 (27.6)	8 (9.2)	36 (41.4)	18 (20.7)
14. How strongly do you agree that you would be able to individualize instruction for each student's needs in a class size of **25 students**?	0 (0.0)	15 (17.2)	6 (6.9)	41 (47.1)	25 (28.7)
15. How strongly do you agree that you would be able to use small groups in your instruction in a class size of **25 students?**	3 (3.4)	27 (31.0)	9 (10.3)	32 (36.8)	15 (17.2)
16. How strongly do you agree that more time is spent on instruction rather than discipline in a class size of **25 students**?	5 (5.7)	3 (3.4)	8 (9.2)	39 (44.8)	32 (36.8)
17. How strongly do you agree that you could incorporate the use of computers and technology into your instruction with a class of **25 students**?	6 (6.9)	22 (25.3)	20 (23.0)	24 (27.6)	15 (17.2)

The mean score for each response to the set of scenario questions was also

calculated. As illustrated in Table 15, respondents were asked to respond using Likert-

scale items: Strongly Agree (coded as 5), Agree (4), Neither Agree or Disagree (3),

Disagree (2), and Strongly Disagree (1). Table 17 provides the mean scores to each of

those ten survey question responses. The mean scores regarding the scenario of a class

size of 15 students were higher, ranging from a mean of 4.39 to 4.82. These mean ratings

indicate a strong perception of being better able to provide personal connections,

individualized instruction, small group instruction, more time on instruction instead of

discipline, and the incorporation of technology into instruction in a class size of 15

students, compared to the mean ratings for a class size of 25 students, for which scenario

the means were lower, ranging from 2.77 to 1.97.

Table 17

Mean Scores to Survey Responses to the Class Size Scenario Questions

Survey Question	Class Size of 15 Students			Class Size of 25 Students		
	N	Mean	Std. Dev.	N	Mean	Std. Dev.
How strongly do you agree that you would be able to connect on a personal level with each student in a class size of ___?	87	4.80	.427	87	2.47	1.140
How strongly do you agree that you would be able to individualize instruction for each student's needs in a class size of ___?	87	4.53	.729	87	2.13	1.021
How strongly do you agree that you would be able to use small groups in your instruction in a class size of ___?	87	4.82	.418	86	2.66	1.194
How strongly do you agree that more time is spent on instruction rather than discipline in a class size of ___?	87	4.39	.894	87	1.97	1.061
How strongly do you agree that you could incorporate the use of computers and technology into your instruction with a class of ___?	87	4.63	.631	87	2.77	1.208

Data Synthesis of Teacher Perceptions

In reviewing the findings from the survey, it is plausible that the teacher perceptions regarding class size are consistent across the school district with those perceptions of the teachers that participated in the case study. Of the 87 K-5 respondents 49.4% chose "12-15 students" as an optimal class size, and an additional 49.4% chose "16-19 students" as the optimal class size, yielding a 98.8% response rate stating class sizes in a Title I school should be less than 20 students. However, the most frequently reported class size at 16.1% was 20 students. These same responses were consistent with interview responses from the first phase of the study. One participant chose a class size of 12 students, and the other three chose 16 or 18 students as the ideal class size. Additionally, the class sizes that were seen during the classroom observations ranged from 19 to 22 students.

The responses to the ten different scenario questions were also consistent with the perceptions of the case study participants. In regards to a class size of 15 students, survey responses ranged from 59.8% to 82.8% in the choice of "Strongly Agree" to being able to connect on a personal level with students (81.6%), individualizing instruction (63.2%), using small group instruction (82.8%), spending more time on instruction than discipline (59.8%), and incorporating technology (69%) with a class of that size. Conversely, the responses were just the opposite when asked the same questions, but with a class size of 25 students. Survey responses ranged from 0.0% to 6.9% in the choice of "Strongly Agree" in the class size of 25 students scenario, with a corresponding 1.1% agreeing they could connect on a personal level with students, 0.0% for individualized instruction, 3.4%

using small group instruction, 5.7% spending more time on instruction than discipline, and 6.9% incorporating technology. The frequency of responses indicated a strong likelihood of being able to provide each of those services in a class size of 15 students over a class size of 25 students. It is plausible that the survey responses would support the same perceptions of the participants in the case study. Where survey responses indicated the aspects of the classroom, including instructional methods, would differ based on the different class sizes, the case study participants argued that class size affects the climate of the classroom, thus affecting pedagogical decisions as well.

Figure 21 illustrates a pictorial representation of the perceptions regarding the affects of class size based on classroom observations, teacher interviews, and survey responses. From the findings of all three, it was clear that class size was perceived to be the foundation to all aspects within the classroom. Just like the foundation of a house (as seen in Figure 21) provides a strong support for the walls, which then support the roof. The latter two cannot exist without first having a strong foundation. Additionally, the type of walls that can exist in that same house depends on what type of foundation there is. The walls of the house represent the classroom climate. It provides the structure of the classroom, and is compiled of classroom management and the interactions that are able to take place within a classroom. In this house representation, the interactions are the building materials of which the walls are made. Thus, the interactions within the classroom direct the feel of the classroom. The classroom management would be the architectural design of the walls, where the windows and doors are situated. The foundation (class size) and the walls (classroom climate) are able exist just as is, but

serve no purpose in terms of shelter without a roof (instruction). However, a roof cannot exist without first a strong foundation and strong walls to sit upon. The ultimate goal in a house is to provide shelter. The ultimate goal in the classroom, as seen in the survey responses and findings from the case study, is instruction. The different instructional methods used within the classroom are the tiles that construct the roof. All of them individually work together to provide the best instruction for the Title I student, which provide better student achievement outcomes.
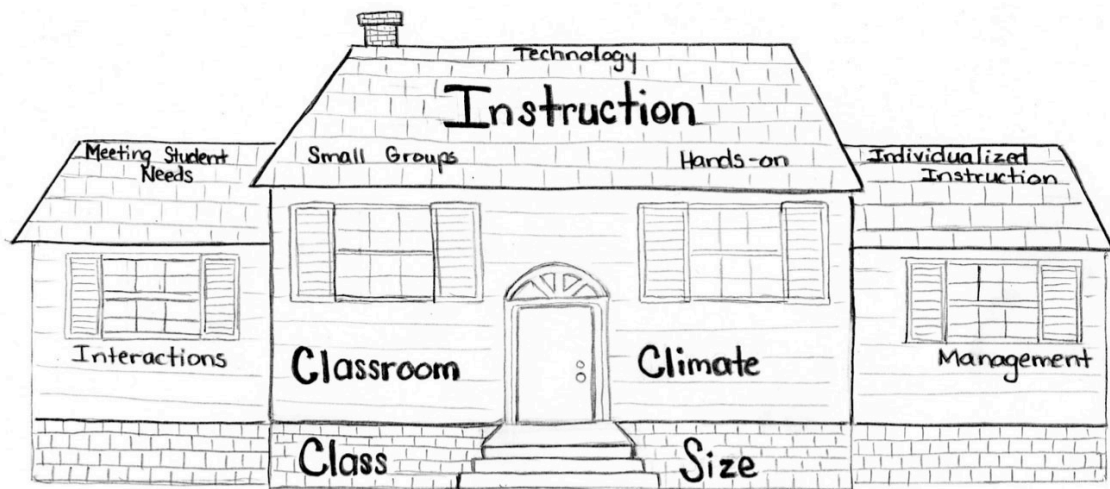
Figure 21. Pictorial representation of Title I teacher perceptions regarding the relationship of Class Size, Classroom Climate and Instruction within a classroom.

Collectively, all of the parts to a house are contingent upon a strong foundation and sturdy base to sit upon. The same was argued about class size in a Title I classroom during the first phase of this study, as well as portrayed in the survey responses. The perceptions of the Title I teacher sample were clear in terms of perceived effects of class size on the many aspects of the classroom. The final segment of this study was intended

to examine student achievement data to explore the perceived effects of class size on systematic assessment data.

Student Standards of Learning Assessment Data

The Virginia Standards of Learning (SOL) data provide this study with the stable ground from which the otherwise qualitative data can be viewed dispassionately. In the initial design for this study, it was confidently expected that the end-of-course data from the SOL testing would be rendered in finer detail by reference to the nine-week assessment data that are required to be produced in this school district (and many others in Virginia, if not across the country). Unfortunately, although preliminary investigations resulted in assurances that such data had been warehoused and would be made available to this study, when the time came to gather these data, it transpired that they existed only partially at best, and then only in aggregate form. Consequently, the findings of this quantitative section will be based only on the SOL data that were made available on a per-student (de-identified) basis.

The SOL data for the target school were coded for each student within each class for three years (2005-06, 2006-07, and 2007-08) at both the Grade 3 and Grade 5 levels for Reading, Writing (for Grade 5 only—Grade 3 students are not tested in Writing), Mathematics, History, and Science. There was one Grade 3 teacher (Teacher A) for whom data existed for all three years for all the Grade 3 SOL subjects, and two Grade 3 teachers (Teacher E and Teacher F) for whom data existed for 2006-07 and 2007-08 for all Grade 3 SOL subjects. There were three Grade 5 teachers (Teacher H, Teacher I, and

Teacher J) for whom data existed for all three years in all Grade 5 subjects. (See Tables 18 and 19.)

Table 18 shows that the Grade 3 class sizes remained constant across the three years 2005-06 through 2007-08. At the same time, the SOL data showed a great deal of variation. For example, if 2005-06 is taken as the basis of comparison, the notation $\downarrow_{05}$ indicates a mean score that is below the corresponding SOL subject mean at the corresponding grade level for that teacher in 2005. Similarly, if 2006 is taken as the basis of comparison, $\downarrow_{06}$ indicates a mean score that is below the corresponding SOL subject mean at the corresponding grade level for that teacher in 2006. Applying this in the case of Teacher A, in 2006-07, there were three mean SOL scores (Reading, Mathematics and Science) that were below the means in 2005-06 for Teacher A. For Teacher A, in 2007-8, all SOL means were below their mean values in 2005-06, and all except Science were below their means in 2006-07. In other words, the SOL scores in Teacher A's class show a pattern of overall decline, despite the class size varying by only one across all three years.

In contrast to Teacher A, the mean SOL scores for the students in Teacher F's class in 2007-08 uniformly increased (by about 40 points in three subjects) over their values in 2006-07 with two fewer students than Teacher A in both years. Finally, Teacher E occupied very much the middle ground, with two SOL subject means in 2007-08 (Reading and Science) above the 2006-07 values, and two SOL subject means (Mathematics and History) below the 2006-07 values. It is important to note that Grade 3 began switching classes for Reading instruction based on student academic ability levels

during the 2006-07 school year. While the students' test scores are reported with the

homeroom teacher's name, the scores are not indicative of that teacher's ability to teach

in that subject.

Table 18

Grade 3 SOL Mean Scores, by Teacher

Tchr	Year	Class Size	Reading (Range)	Math (Range)	History (Range)	Science (Range)
A	2005-06	19	463.47 (296-600)	466.68 (295-600)	472.78 (340-600)	468.17 (378-521)
	2006-07	20	443.88 (282-600)	$454.00\downarrow_{05}$ (321-600)	$478.00\uparrow_{05}$ (316-562)	$429.63\downarrow_{05}$ (268-546)
	2007-08	19	$413.21\downarrow_{05}\downarrow_{06}$ (235-554)	$421.74\downarrow_{05}\downarrow_{06}$ (251-523)	$471.68\downarrow_{05}\downarrow_{06}$ (264-600)	$444.58\downarrow_{05}\uparrow_{06}$ (211-539)
E	2006-07	17	445.47 (302-600)	469.94 (366-547)	498.29 (391-600)	454.24 (395-546)
	2007-08	17	$458.60\uparrow_{06}$ (314-600)	$454.71\downarrow_{06}$ (339-600)	$463.59\downarrow_{06}$ (383-600)	$459.71\uparrow_{06}$ (348-600)
F	2006-07	17	413.41 (258-600)	452.82 (309-592)	462.82 (258-600)	436.06 (268-592)
	2007-08	17	$459.18\uparrow_{06}$ (285-600)	$466.18\uparrow_{06}$ (299-600)	$519.00\uparrow_{06}$ (317-600)	$471.65\uparrow_{06}$ (327-600)

Note: For example, the $\uparrow_{05}$ indicates that the mean SOL score was greater than the score for that subject in that particular teacher's class in 2005. Starting in 2006-07, mean scores for Reading are not indicative of each teacher's teaching ability in that subject, due to students switching classes in that subject based on academic ability levels.

In stark contrast to Grade 3, the class sizes in Grade 5 across the three years 2005-06 through 2007-08 varied markedly, and were sometimes associated quite counter-intuitively with SOL data. For example, the SOL means for the students in Teacher I's class showed a decrease of from 10 points to 30 points from 2005-06 to 2006-07 despite the class size decreasing by eight students from 26 to 18. The following year (2007-08), the class size increased by five students to 23, and the SOL scores again decreased by double-digit points. This latter outcome could be attributed to an increase in class size, but that attribution is less compelling in the absence of an increase in SOL means when the class size decreased.

It is important to note that Grade 5 was departmentalized into core content subjects in 2005-06. Each teacher was responsible for teaching Reading and Language Arts to their homeroom group of students, and then one core content subject to the whole grade level. Additionally, in 2006-07, there was fourth Grade 5 teacher. That year Teacher H and Teacher I paired up and departmentalized through team teaching in Science and Social Studies between the paired classrooms. Teacher J was paired up with the fourth Grade 5 teacher. Classes were also assigned based on student academic ability. In 2007-08, Grade 5 returned to three classrooms. Teachers H and I continued with the team teaching model used the prior year, and Teacher J taught all subjects to her homeroom group of students.

Table 19

Grade 5 SOL Mean Scores, by Teacher

Tchr	Year	Class Size	Reading (Range)	Writing (Range)	Math (Range)	History (Range)	Science (Range)
H	2005-06	26	438.54 (320-520)	441.14 (323-511)	479.27 (268-600)	436.35 (273-560)	434.96 (353-500)
	2006-07	18	$417.56\downarrow_{05}$ (246-600)	$436.39\downarrow_{05}$ (307-556)	$460.50\downarrow_{05}$ (315-600)	$430.11\downarrow_{05}$ (289-600)	$448.72\uparrow_{05}$ (349-561)
	2007-08	23	$473.61\uparrow_{05}\uparrow_{06}$ (339-600)	$439.11\downarrow_{05}\uparrow_{06}$ (335-532)	$488.70\uparrow_{05}\uparrow_{06}$ (266-600)	$425.95\downarrow_{05}\downarrow_{06}$ (249-600)	$458.57\uparrow_{05}\uparrow_{06}$ (325-551)
I	2005-06	26	482.08 (351-600)	467.79 (357-560)	511.38 (340-600)	454.19 (353-600)	449.15 (387-558)
	2006-07	18	$471.67\downarrow_{05}$ (305-600)	$456.07\downarrow_{05}$ (397-556)	$482.18\downarrow_{05}$ (335-600)	$465.00\uparrow_{05}$ (261-600)	$438.75\downarrow_{05}$ (305-525)
	2007-08	23	$460.82\downarrow_{05}\downarrow_{06}$ (363-600)	$439.05\downarrow_{05}\downarrow_{06}$ (383-480)	$477.91\downarrow_{05}\downarrow_{06}$ (370-600)	$437.41\downarrow_{05}\downarrow_{06}$ (340-520)	$437.55\downarrow_{05}\downarrow_{06}$ (386-515)
J	2005-06	26	470.96 (362-600)	440.74 371-560)	507.92 (345-600)	447.20 (300-600)	442.08 (353-558)
	2006-07	17	$516.69\uparrow_{05}$ (387-600)	$498.75\uparrow_{05}$ (411-556)	$537.06\uparrow_{05}$ (250-600)	$503.06\uparrow_{05}$ (430-600)	$493.44\uparrow_{05}$ (420-600)
	2007-08	23	$511.57\uparrow_{05}\downarrow_{06}$ (439-600)	$463.61\uparrow_{05}\downarrow_{06}$ (391-559)	$537.22\uparrow_{05}=_{06}$ (395-600)	$508.04\uparrow_{05}\uparrow_{06}$ (407-600)	$484.35\uparrow_{05}\downarrow_{06}$ (409-551)

Note: The $=_{06}$ indicates that the mean SOL score was effectively equal to the score for that subject in that particular teacher's class in 2006. Although scores are reported with the homeroom teacher, the mean scores are not indicative of each Grade 5 teachers' teaching ability, as the students switched classes for instruction in each class.

Summary of Quantitative Findings

In colloquial terms, the quantitative findings in Tables 18 and 19 provide something of a "reality check" in relation to the earlier interview data and the survey data. The early de-identification of the SOL data (at the school district level) prevented the implementation of the analysis of variance approach initially intended for these data, because it was not possible to assign the individual SOL scores to particular students across the classes. The SOL data for the students of these Grade 3 and Grade 5 teachers strongly suggest that the outcomes are influenced by more than just class size. A global indicator of the variability that exists with remarkably consistent and relatively small class sizes is provided by the Grade 3 data for Teacher A, Teacher E, and Teacher F. For these three teachers, there were seven SOL means over the next two years that were less than the corresponding 2005-06 means, three that were less than the corresponding 2006-07 means, and eight that were above the corresponding 2006-07 means.

Student academic ability of each different cohort of students from year-to-year would be a plausible factor influencing student outcomes at the end of the year, in addition to class size. The intention was to use the earliest nine-week assessment data as a proxy for "entering academic ability." Unfortunately, the inability to utilize what nine-week assessment data could be found for these classes and teachers prevented this study from addressing "early" assessment data as a proxy for "entering academic ability."

Even in the presence of the nine-week assessment data, there would be nothing in these quantitative findings to argue against class size as being one of a number of factors with the potential to influence learning outcomes. However, as will be discussed

subsequently, these data support carefully nuanced approaches to the influence of class size on assessment outcomes, and, in particular, thorough local knowledge of the circumstances underpinning the creation of classes and the assignment of teachers to classes.

CHAPTER FIVE:

DISCUSSION, CONCLUSIONS AND IMPLICATIONS FOR FURTHER RESEARCH

Discussion

Entering into this study, as a former Title I teacher, I had preconceived notions as to what the effects of class size would be on student achievement. However, the findings from this study clearly showed that class size is not, in colloquial terms, a "cut and dry" issue. In fact, there are several factors, or nuances, that are associated to class size, as evident in the findings from the Virginia SOL data collected for this study. Hence, the best place to begin the discussion of this study is to start by looking at the SOL data.

Insider View of Student Achievement Data

Grade 3. At first glance of the SOL data, it would appear that Teacher A in Grade 3 was failing. Using the 2005-06 mean scores as a base, the mean test scores for the two subsequent years were lower. In 2006-07, mean scores for Reading (443.88 ↓20 points), Mathematics (454 ↓12 points), and Science (429.63 ↓39 points) dropped in comparison to the 2005-06 mean scores in the respective subjects. The point differential between mean scores ranged from 12 – 39 points. Based on the teacher perceptions of the effects of class size from this study, one would expect there to have been an increase in class size from 2005-06 to 2006-07 to account for the drop in scores. However, there was very little variance in class size, increasing from 19 students to 20 students from one year to

the next. There was a further decrease in mean scores for the 2007-08 school year, with a drop in the Reading (413.21 ↓30 points), Mathematics (421.74 ↓33 points), and

History (471.68 ↓7 points). However, that year there was an 11-point gain in the mean score for Science (444.58).

By looking at just the mean scores of the SOL data, Teacher A appeared to be failing across the board. However, thorough local knowledge of the circumstances underpinning the creation of classes and the assignment of teachers to classes was key in interpreting these mean scores. For example, the SOL scores did not portray the overall academic growth of the students in the classroom. The SOL scores provided a mere snapshot of that particular day of testing in each subject. Without the individual student achievement scores on the nine-weeks assessment data, it was inconclusive how much growth in academic ability of each student occurred within each year. The mean scores may indicate a drop in student achievement in 2006-07 and 2007-08, however, each year was taught with a different group of students. In addition, each different group of students may have started off the school year at a lower academic level than the group of students from the year prior. The creation of classes at this Title I school was based on pure randomization. This presents a "luck of the draw" scenario in each classroom. Each teacher is at the mercy of the "luck of the draw" as to which students they get from year to year, as seen with Teacher A.

Additionally, the SOL scores did not indicate any teaching formalities that may have existed each year. For example, starting in the 2006-07 school year, Grade 3 implemented the departmentalization of Reading instruction, breaking students into ability groups, in which students switched classes for Reading instruction. Therefore, the decrease in the mean score for Reading was not indicative of Teacher A's teaching in that

subject. The teaching formality was just another example of the nuanced approaches to the influence of class size on student assessment outcomes, thus providing a plausible explanation behind the decrease in the mean scores for Reading.

Grade 5. There were several nuanced factors that could offer a plausible explanation into the unexpected findings from the Grade 5 SOL data. In contrast to Grade 3, there was a significant difference in class size from 2005-06 to 2007-08 in Grade 5. Class sizes decreased from 26 students in a class to 18 students from 2005-06 to 2006-07. Based on the teacher perceptions defined in this study, one would expect great gains in student achievement between those two years. However, quite the opposite was discovered. Where mean scores dropped for Teacher H in Reading (417.56 ↓19 points), Writing (436.39 ↓5 points), Mathematics (460.50 ↓19 points), and History (430.11 ↓6 points), Teacher I also had a decrease in mean scores in Reading (471.67 ↓11points), Writing (465.07 ↓2 points), Mathematics (482.18 ↓19 points), and Science (438.75 ↓11 points) when class sizes dropped from 26 students to 18 students. In a stark contrast, there was a great gain in mean scores across the board for Teacher J, with a 30 to 58 point range increase in scores when the class sizes dropped from 26 students to 18 students. The apparent gains in student achievement for Teacher J could be attributed to the significant decrease in class size that year. However, the same results were not apparent for Teacher H and Teacher I.

Even with the results seen in Grade 5 student data, again local knowledge of the circumstances underpinning the creation of classes and the assignment of teachers to classes was key in interpreting these mean scores. What the SOL data did not show was

that in 2005-06, Grade 5 departmentalized into core content subjects, as seen in during the classroom observations of the case study. The departmentalization of instruction was implemented to better prepare the students for the changes in instruction that occur in middle school. Each teacher was responsible for teaching Reading and Language Arts to her homeroom group of students, and one core content subject to all of Grade 5. The students switched classes for Science, History, and Mathematics. As discussed in Review of the Literature, studies (Piechura-Couture, Tichenor, Touchton, Macisaac, & Heins, 2006; Gerretson, Bosnick, and Schofield, 2008) reported the departmentalization of subjects enabled each teacher to become "an expert" in the core content subject they taught. Planning for instruction was concentrated on Reading, Language Arts, and one core content subject, as opposed to all five subjects. This provided for a more enriched instruction in each core content subject. However, in 2006-07 an additional classroom was added to Grade 5, thus causing the decrease in class size. During that year, teachers were paired and students switched for Science and History between the paired teachers. Each teacher was responsible for teaching Reading, Language Arts, and Mathematics to her homeroom group of students, in addition to either Science or History to the two different paired classes. This departmentalization format changed slightly the following year as well. Teacher H and Teacher I continued switching classes as they did in 2006-07. However, Grade 5 dropped back down to three classrooms, thus increasing the class size to 23 students in each classroom. In addition, Teacher J taught all subjects to all of her students. The change of subject matter taught among teachers could have attributed to

the decrease in mean SOL scores in Reading and Writing for Teacher J, in addition to the increased class size.

In addition to a change in the form of departmentalization, the class assignment of students was conducted differently during the 2006-07 school year. In an effort to provide for more enriched instruction based on student needs, students were specifically placed into different class categories. Teacher H's class was comprised of all of the Exceptional Education students for Grade 5 and students of lower academic ability. Teacher I's class was comprised of what would be considered "normal" students in terms of academic ability as discussed earlier in the Findings chapter of this study. Finally, Teacher J's class was comprised of all of the Grade 5 Gifted students and those students of higher academic ability. The composition of each class was an aspect that needed to be factored into the change in class size as well. While Teacher H appeared to have a great decrease in student achievement, despite a dramatic decrease in class size, the "entering academic level" of that class was quite different than that of Teacher I and Teacher J's classes. Although this was not a "luck of the draw" scenario as seen with Teacher A in Grade 3, the individual students within each classroom did offer a plausible explanation for outcome in student achievement scores on the SOLs for 2006-07 and 2007-08.

The teacher perceptions of class size were consistent across the whole school district, as reported in the findings of the case study and the survey responses of this study. However, the student achievement scores in the SOL data indicated quite the opposite case. The teacher perceptions defined in this study cannot be dismissed, however. The other nuances of class size need to be considered as factors that affected

the student achievement SOL scores as well. As stated above, it was made clear with this study that class size is not a "cut and dry" phenomenon as it may have been discussed in previous studies. There too, several factors regarding class size need to be considered as well.

Considered Class Sizes

Other nuances of class size to consider are the actual number of students in a class, and the make-up of the student population. As seen in Project STAR, small class sizes were identified as those with 13 to 17 students (Achilles, 2003; Boyd-Zaharias, 1999; Finn, 2002; Jacobs, 1987; Konstantopoulos, 2008; Nye, Hedges, & Konstantopoulos, 2002). The class sizes observed during the case study in this study ranged from 19 to 22 students, above what was considered to be the small class size that saw the greatest gains in student achievement from Project STAR. However, the researchers from Project STAR were very careful to report the findings from that study. The student population of Tennessee at the time of the study was homogeneous in terms of the diversity within the representativeness of the population. The particular Title I school purposefully selected to participate in the case study phase of this study was specifically chosen for the great diversity in student representativeness, compared to that of the whole school district. As found through interview responses and classroom observations of this study, the student population at Title I schools and the needs of the Title I students created challenges that were interwoven into class size. This too was plausible explanation into the difference in observed effects of class size on student

achievement from Project STAR, and the difference between the teacher perceptions found in this study.

Wisconsin's SAGE program was sighted for finding similar results to Project STAR in creating class sizes of 15 students, however with a more diverse student population (American Educational Research Association, AERA, 2003; Biddle & Berliner, 2002; Molnar, Smith, & Zahorik, 1999). While the representativeness of the student population was more indicative of the student population of the Title I school in the case study, the class sizes were still smaller than what was observed and reported with the SOL data. Here, one could argue that there is not much difference between 15 and 17 students, or 17 and 19 students. However, as reported from the findings of the coded classroom observations of this study, it only took one individual student or one small group of students to affect the whole climate of the classroom with negative student behaviors. It is that one difficult student that could make the difference between 17 and 19 students. Moreover, it is plausible to deduct that when there is more than one difficult student in a classroom, it could make the difference between 15 and 17 students. As seen within the classroom observations of this study, the classroom interactions drove the climate of the classroom. The classroom climate, as well as the students' needs drove the classroom instruction. It is conceivable to argue that in increase in class size would increase the challenges present in the Title I classroom, thus affecting student achievement.

Effective Instructional Methods

Although the observed effects of class size on student achievement were not consistent with the reported Title I teacher perceptions of class size found in this study, it is still important to note what the SOL scores did portray. Passing scores on the Virginia SOL assessments range from a score of 400 to 499. Scores of 500 to 599 are considered Passing Advanced scores, with 600 being a Perfect score. Despite the observed incongruence between class size and student performance, each of the mean scores for all of the SOL assessments in Grade 3 and Grade 5 fell within the Passing range, and a fair amount of mean scores fell in the Passing Advanced range. This would indicate that the Grade 3 and Grade 5 teachers at the Title I school used in the case study were using instructional methods that are most effective to teach at-risk students by connecting with students on personal basis, using small group instruction, individualizing instruction, and incorporating technology into instruction. As coded during each of the observations in this study, each participating teacher used a variety of the best effective instructional methods to use with at-risk student populations. As found in the interview and survey responses, teachers made changes within their instructional methods used within the classroom to differentiate for different class sizes. Regardless of the class size, teachers were using small groups, individualized instruction, and technology within their daily instruction. In addition, they were building personal relationships with students and connecting the curriculum to their culture. However, it was greatly noted through interview responses that the class size had effects on the efficiency in using each instructional method, as well as the increased level of stress on the teacher. Large class

sizes made it more difficult to incorporate all of those methods. This would be another factor associated to class size in Title I schools.

<div align="center">**Limitations**</div>

There were several limitations to this study. First the number of individuals that volunteered to participate in the case study was limited. This was due to the restraints regarding teaching experience. Individuals with fewer than five years of experience may have been able to offer rich information regarding the needs of Title I student populations, and could have offered a fresh look into what goes on in the classroom.

Another limitation within this study was the access to possible survey respondents. The participation of a Title I school's teachers on the survey rested solely on the permission of the principal. There may have been many more teachers who wanted to share their beliefs, but could not participate due to their principal denying access to them.

The time of year affected the survey as well. This particular school district does not permit any research or teacher surveys to be conducted after the month of February. This is due to SOL testing starting in March. Therefore, the survey was distributed during the month of February. During this time, not only was the school district closed on several occasions due to inclement weather, the teachers were also inundated with nine-weeks assessments, report cards, and preparing for the impending SOL assessments. Principals expressed that the teachers already had a great deal of extra responsibilities to address at that time of year, and they did not feel comfortable with adding additional paperwork to their already cumbersome load.

Finally, the availability of student achievement data was an issue within this study. The nine-weeks assessment data was a major limitation to this study. The availability of this data was contingent upon individual teachers keeping this data from year-to-year. Furthermore, the nine-weeks assessment data existed only partially at best, and then only in aggregate form. In addition only the SOL data were made available on a per-student (de-identified) basis.

Conclusions

Compiling all of the findings of this study, several conclusions can be made regarding class size in Title I schools. First, there was a perceived ideal class size that was clearly defined in this study. Derived from interview and survey responses, the ideal class size for a Title I classroom ranged from 12 to 18 students.

Another conclusion that can be made from this study is the use of appropriate and beneficial instructional methods with at-risk students in Title I schools is evident and is affected by class size. Through the classroom observations, teacher interviews and survey responses it can be concluded that teachers within Title I schools are using the instructional strategies that have been found to work best with at-risk student populations, such as connecting with students on a personal basis, using small group instruction, individualizing instruction, and incorporating technology into daily instruction. However, based on the findings from this study, teachers believed class size affects the efficiency of incorporating each beneficial instructional method within the Title I classroom.

Most importantly, it can also be concluded from this study that there are no simple answers in regard to class size. The findings regarding teacher perceptions of class

size collected from the case study and survey responses of this study were inconsistent to the findings from the observed effects of class size on the systematic student achievement data. However, as previously discussed, it is important to consider there are several nuances associated with class size that also have the potential to effect student achievement outcomes. These nuances provided several implications for further educational studies, as discussed later in this chapter.

<div align="center">**Recommendations**</div>

There are several recommendations for teaching and implementation of instruction that can be derived from the findings of this study. First, in the occurrence that class size cannot be reduced, the use of small group instruction and individualizing instruction have shown to be beneficial to student learning regardless of class size. As seen during the classroom observations of this study, the implementation of small group instruction enables individualized instruction to take place within the Title I classroom. Furthermore, as seen with the use of the Promethean Board, the use of technology within the classroom, and the implementation of hands-an activities increased student engagement. Students were actively participating in the learning process through the use of these instructional methods. From the findings of this study, I would recommend the use of small group instruction, hands-on activities, and the incorporation of technology as means of captivating student engagement in Title I classrooms, regardless of class size, in an effort to improve the learning of Title I students.

Moreover, it is recommended from the findings of this study, that upper-level elementary grades departmentalize instruction through team teaching. As seen with the

Grade 5 SOL scores, departmentalization into the core content subjects appeared to be beneficial in terms of student learning and student achievement, regardless of class size. The greatest gains in student achievement occurred when the grade level was departmentalized and class sizes were 26 students. The findings from this study provide a strong case for team teaching at the upper-level elementary grades.

After completing this study, there are several recommendations I would also make to improve this study. First, the coding process during the classroom observations would have been more accurate with additional co-observers. The busy nature of a classroom made it difficult to code each interaction. With additional co-observers, each one could focus on a specific area of the classroom during busy times, such as during small group instruction or cooperative learning activities.

Another recommendation would be to change the time of year to distribute the survey. Due to restrictions set by the school district, the month of February is the cut-off for distributing surveys. Anytime during the months of November through January would be better, and could increase the number of participating Title I schools, thus increasing the number of respondents.

Implications for Further Research in Education

The results of this study can be expounded through future studies. Extending the findings of this study, a study could be conducted comparing the observed classroom interactions that take place within Title I schools with the observed classroom interactions in non-Title I schools with same class size. Comparisons regarding the number of interactions that can take place in each type of classroom, as well as the type

of interactions that take place would provide additional insight into the different student needs within different student populations. Would there be a difference in the number of negative interactions that take place within Title I student populations and students of non-Title I populations? Would the interactions play a key role in student achievement outcomes? These are aspects that could influence the effects of class size on student achievement.

Additionally, continuing the findings of this study, one could conduct the same classroom observations, only in larger class sizes than what was observed during this study. The classrooms that were observed in this study had a range of 19 to 22 students in each class. Larger class sizes would include 25 or more students per class in a Title I school. It would be compelling to explore whether there is a significant increase in the number of negative interactions within the larger class sizes, as perceived by the participants of this study.

The reported results of the student achievement scores in Grade 5 also suggest a strong argument for the departmentalization of core content subjects in the upper elementary grade levels. As already seen in studies such as Gerretson, Bosnick, and Schofield (2008), departmentalization through team teaching has created several gains in instructional practice as well as provide more teacher benefits, such as reduced work-related stress. In that study, teachers reported feeling less stressed at work by having more time to plan enriched instruction due to having fewer subjects to plan. In addition, they reported feeling more confident in their teaching by becoming specialized in the

subject they taught. Further research into this topic could offer insight into to possible means of teacher retention in schools by decreasing work-related stress.

Furthermore, as seen during the observations of this study, the use of the Promethean Board increased the level of student engagement. Future studies comparing the engagement of students who attend class with the Promethean Board technology and the engagement of students who attend regular classrooms could offer great insight into possible effects on student achievement outcomes. Additionally, such a study would aid in finding the best educational practices and experiences for students in Title I schools.

The findings of this study also provide insight to other aspects in education. With the new discussions of the possible implementation of merit pay programs in the field of education, the findings and discussions from this study provide sound evidence that any type of merit pay program should be carefully considered. The findings from this study would argue against the implementation of a performance-based merit pay program. As seen with mean SOL scores for Teacher A, without considering the outside factors associated with class size, it would appear that she failed as a teacher in terms of student performance. However, with using just the SOL scores as a means of measuring student performance, there is no way to account for the actual academic growth of each student, as well as factor for the natural maturation of each student. Both have influence on how each student performs. In addition, performance-based pay programs do not factor for the "luck of the draw" scenario regarding the level of learners in each classroom, much less factor for students' achievement being affected by variables outside of the classroom. The findings and discussions of this study do however provide a strong case for a value-

added approach to merit pay programs. Further research in this area would not only stand

to benefit the education of Title I students, but of all students.

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Appendix A
Letter to Participants

Dear Title I Teacher,

My name is Jennifer Murphy, and I am a doctoral student at Virginia Commonwealth University. I am currently investigating the effects of class size on the student achievement of Title I students. As a Title I teacher for many years, I have experienced various class sizes: smaller classes of 18 to 20 students, and larger classes of 25 to 30 students. In working with different class sizes, my experience has shown that this issue could be one of the contributing factors in the level of student achievement among Title I students.

In an effort to investigate this phenomenon, I would like to interview Title I teachers regarding their perceptions of class size effects on student achievement. This interview is voluntary, and all participants will remain anonymous. There will not be any identifiable information used or included in my report. In addition, each participant will receive a copy of his or her interview, and will be able to make any editions.

By relating teachers' perceptions regarding class size at Title I schools to issues of classroom quality, policy changes may result in the provision of the most effective and meaningful educational experiences for students today and in the future. In an effort to collect as much data as possible, I am asking you to participate in the interview process of this study. I would greatly appreciate your participation. If you have any questions regarding this study, please feel free to contact me by phone (804) ***-**** or by email: **********. Thank you in advance for your assistance in collecting this data.

Sincerely,

Jennifer S. Murphy

Appendix B
Letter to Parents

April 24, 2009

Dear Parents,

My name is Jennifer Murphy, and I am a doctoral student at Virginia Commonwealth University. I am in the process of conducting a study for my dissertation to examine how class size affects student learning. To help me develop a teacher survey for this study, I will conduct classroom observations at ********** Elementary School to observe your child's classroom teacher, the different instructional methods used in the classroom, and how the teacher interacts with the students. No information will be collected on any student for this study and no names or identifying information will be included on the observation notes. Additionally, observations will be unobtrusive and will not hinder your student's learning in any way.

I will also be obtaining SOL and nine-week assessment data from the school division. However, the data that is being provided to me will not contain any identifying student information. Prior to receiving the data, all student names and other identifying information will be removed from the test data.

This study is being conducted as part of a dissertation project and it is not being conducted by ********* County Public Schools. However, the results from the study will be shared with school system staff to inform best practices.

If you have any questions or concerns, please contact me at (804) ***-****. I thank you in advance for your cooperation.

Sincerely,

Jennifer Murphy

Appendix C
Instruction Plan

Name _____   School _____

Grade Level_____   Subject_____   Date _____

1. Briefly describe the instructional characteristics and climate of your class.

2. What are your goals for this lesson? What do you want the students to learn?

3. Why are these goals suitable for this group of students?

4. How do these goals support the district's curriculum, state frameworks, and content standards?

5. How do these goals relate to broader curriculum goals in the discipline as a whole or in other disciplines?

6. How do you plan to engage students in the content? What will you do? What will the students do? (Include time estimates).

7. What difficulties do students typically experience in this area, and how do you plan to anticipate these difficulties?

8. What instructional materials or other resources, if any, will you use?

9. How do you plan to assess student achievement of the goals? What procedures will you use?

10. How do you plan to use the results of the assessment?

Appendix D

Diagram of Classroom Interactions
and Field Notes

Chalkboard

Teacher's Desk		Teacher

St 1	St 2	St 3	St 4	St 5
St 6	St 7	St 8	St 9	St 10
St 11	St 12	St 13	St 14	St 15
St 16	St 17	St 18	St 19	St 20

Field Notes
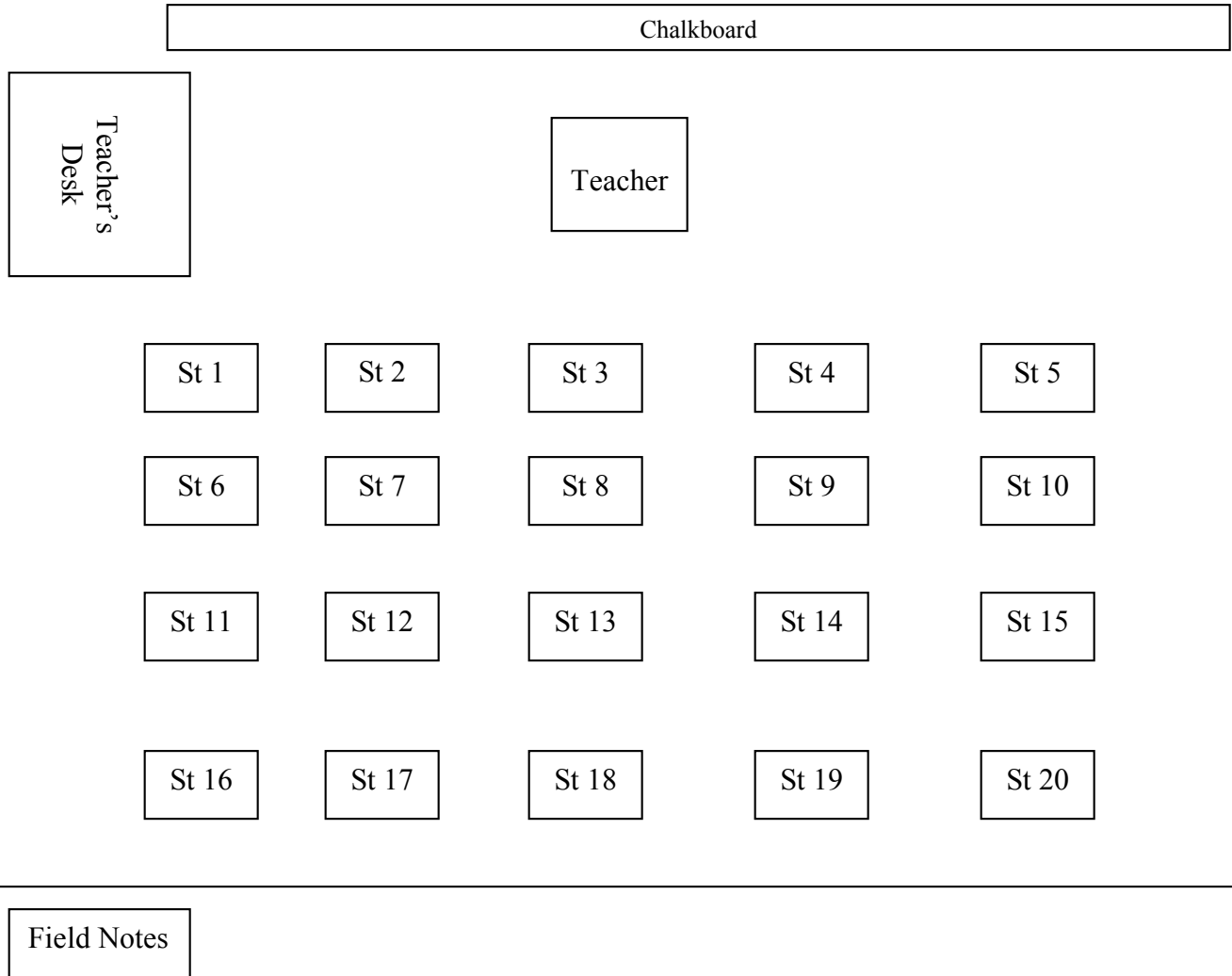
Appendix E
Observation Coding Protocol

Symbol	Description
⟶	Indicates the **direction of a verbal interaction** made between teacher and student, as well as between students within the classroom.
+	Indicates **a positive interaction between members of the classroom**. Positive interactions include: teacher facilitations during classroom instruction, teacher greeting students as they come in the classroom, teacher building warm and trusting relationship with students through warm and supportive conversation, teacher answering student questions with a positive demeanor, teacher giving students positive reinforcement, teacher offering praise of students, students participating in classroom discussions, students asking purposeful questions, and students helping peers, students raising hands displaying good classroom etiquette.
−	Indicates **a negative interaction between members of the classroom**. Negative interactions include: teacher needing to interrupt instruction to manage student discipline issues in the classroom, teacher needing to re-direct off-task students, teacher answering student questions with a negative demeanor, teacher failing to recognize students' needs, students interrupting the instructional process with outbursts, students asking deterring or off-task questions, students antagonizing or bullying peers, students interrupting instruction to report a behavioral issue, conflicts between teacher and student or student and student.
*	Indicates a **student** with **Exceptional Education needs**.
◯	Indicates a **female** student.
□	Indicates a **male** student.
T (in circle)	Indicates the **placement of the teacher** throughout the classroom.
/	Indicates an **absent student/empty seat** within the classroom.
CC	Indicates the teacher **connecting culturally** with students. This includes relating effective practices to the social, cultural, and historical characteristics and backgrounds of students in the classroom.
SG	Indicates the use of **small group instruction**. Small group instruction includes: ability groupings of students that enable students to interact with their peers and teacher, student instruction delivered through different centers throughout the room.
I	Indicates the teacher providing **individualized instruction**. Individualized instruction includes: the altering of activities to meet the needs of individual students, the used of small ability groups during instruction, computer-assisted learning activities for students.
T	Indicates the use of **technology and computer-assisted instruction** within the classroom. This includes the use of student computers, Promethean Interactive Boards, and laptop computers during instruction.
IND	Indicates students doing **independent work**. This includes any activities in which the students participate in or complete on their own.
WG	Indicates a **whole group** activity in which the teacher addresses the class as a whole.
[Time]	Indicates the **amount of time** it takes for the students in the class to settle down during and after transitions within the classroom.
A,B,C,D	Indicates a **group of desks** arranged to form a **table** in the classroom.
RH	Indicates a student participating or actively engaged with a **raised hand**

Appendix F

Interview Guide

Introduction, purpose of interview, anonymity.

Thank you for agreeing to meet with me to discuss your perceptions of the advantages and disadvantages to different class sizes. You and other experienced Title I teachers will participate in this exercise.

The purpose of this study is to better understand how different class sizes have different affects on student learning and student achievement. I will ask you about your personal perceptions on class sizes and if you see any advantages or disadvantages in that regard.

All that you share with me will be confidential. I will not share any of the information that we discuss today with anyone that you work with, or with anyone that could have an impact on your job. I will, however, share the information with other people involved in the study. Your name and any other names you mention will not be used, nor will any other information that could be used to identify you.

I would like to record the interview so that I can remember everything you say. Is that okay with you? I will transcribe the interview word by word, and I will give you a copy. I will make any changes or additions you request.

During the interview, if you feel uncomfortable with any of the questions I ask, please let me know. I expect the interview to last 20-30 minutes. But you can stop the interview at any time that you wish.

If you give me your permission to use this information, please sign this form.

Do you have any questions before we start?

The interview will then proceed with soliciting information about ideas, concepts, issues in the following areas: demographic information, teaching experience, class instruction and class size.

Appendix G

Letter of Informed Consent

I agree to have my interview included in the study An Investigation on the Effects of Class Size on Student Achievement at Title I Schools.

I give permission for the interview to be tape-recorded and understand that all parts of the interview are confidential.

I understand that I do not have to answer all the questions and that I can stop the interview at any time.

I also understand that I can receive a written copy of the interview and that I can make changes or additions to the transcript.

I, _____, agree to participate in this project.

_____ _____
   Informant's Signature   Date

_____ _____
      Witness   Date

Appendix H
Interview Questions

1. Demographic Information

a. Describe your own educational experiences.

b. When you were in elementary school, describe what type of class sizes would you say you experienced: small class size, average, or large class size?

2. Teaching Experience

a. How long have you been teaching?

b. Have you always taught in a Title I school?

c. Describe the different settings you have taught in.

d. Describe the type of students you service at your current school.

3. Classroom Instruction

a. What different types of methods do you use to deliver instruction in your classroom?

b. If there are any, what are some aspects that may influence your pedagogical decisions within your classroom? By pedagogical I mean anything to do with teaching.

4. Class Size

a. Thinking of your different years of teaching, describe one of your most enjoyable years of teaching?

b. What characteristics of that year made it so enjoyable?
    1.Elaborate on the _____ characteristic.

c. Describe a year that was most difficult for you?

d. What characteristics made it so difficult?
    1.Elaborate on the _____ characteristic.

e. Describe the perfect-sized classroom, what would it look like?
    1. How many students would it have?
    2. What type of instructional methods could you use in the perfect-sized classroom?
    3. What would the student behavior and classroom management look like?
    4. What would the climate of the classroom look like?
    5. What would the student achievement look like?
    6. What would the interactions between teacher and students look like in the perfect classroom?

f. Now describe the exact opposite. What would a classroom with too many students look like?
    1. How many students would it have? What would be too many students?
    2. Would the type of instructional methods you use change?
    3. What would the student behavior and classroom management look like?
    4. What would the climate of that classroom look like?
    5. What would student achievement look like?
    6. What would the interactions between teacher and students look like in the too large classroom scenario?

7. What would be the benefits of having too many students?

g. What are other aspects of the classroom that are important and are affected by class size that I may be forgetting to ask about?

h. What else should I know about the relevance of class size in Title I schools?

i. What else do you think I should know about helping kids at Title I schools be successful?

5.   Closure

Thank you for you time. At this time, I don't have any more questions. Is there anything else you would like to share? Is there anything you believe I should know?

Thank you for sharing your thoughts and ideas with me. As I mentioned before we started, you will not be identified in any away with the information you have given. I will be sending you a copy of the interview for your review so you can make any changes or additions. Thanks again for your time.

Appendix I
Teacher Perceptions Survey

Demographic Questions
1. How many years of teaching experience do you have? (Please check one)
    0-4 years   **5-9** years   **10-14** years   **15+** years
    ☐   ☐   ☐   ☐

2. How many years have you taught in a **Title I school**? (Please check one)
    0-4 years   **5-9** years   **10-14** years   **15+** years
    ☐   ☐   ☐   ☐
3. What grade level do you teach? (Please circle one)

    K   **1**   **2**   **3**   **4**   **5**   **Other:** _____

4. Gender: (Please check one)
    Male   **Female**
    ☐   ☐

Survey Questions
5. What would be an **optimal** sized classroom at a Title I school? (Please check one)

12-15 students   **16-19** students   **20-23** students   **24-27** students   **28-30** students
     ☐   ☐   ☐   ☐   ☐

6. What would be an **unfavorable** sized classroom at a Title I school? (Please check all that apply)

12-15 students   **16-19** students   **20-23** students   **24-27** students   **28-30** students
     ☐   ☐   ☐   ☐   ☐

7. How many students do you currently have in your classroom? _____

Use the following scenario to answer Questions 8 – 12:

You have been assigned a class of **15 students** at your Title I school. Please answer the following questions by **circling** your selection:

8. How strongly do you agree that you would be able to connect on a personal level with each student in a class size of **15 students**?

Strongly Agree	Agree	Neither Agree or Disagree	Disagree	Strongly Disagree

9. How strongly do you agree that you would be able to individualize instruction for each student's needs in a class size of **15 students**?

Strongly Agree	Agree	Neither Agree or Disagree	Disagree	Strongly Disagree

10. How strongly do you agree that you would be able to use small groups in your instruction in a class size of **15 students**?

_____	_____	_____	_____	_____
Strongly Agree	Agree	Neither Agree or Disagree	Disagree	Strongly Disagree

11. How strongly do you agree that more time is spent on instruction rather than discipline in a class size of **15 students**?

_____	_____	_____	_____	_____
Strongly Agree	Agree	Neither Agree or Disagree	Disagree	Strongly Disagree

12. How strongly do you agree that you could incorporate the use of computers and technology into your instruction with a class of **15 students**?

_____	_____	_____	_____	_____
Strongly Agree	Agree	Neither Agree or Disagree	Disagree	Strongly Disagree

Use the following scenario to answer Questions 13 – 17:
You have been assigned a class of **25 students** at your Title I school. Please answer the following questions by **circling** your selection:

13. How strongly do you agree that you would be able to connect on a personal level with each student in a class size of **25 students**?

_____	_____	_____	_____	_____
Strongly Agree	Agree	Neither Agree or Disagree	Disagree	Strongly Disagree

14. How strongly do you agree that you would be able to individualize instruction for each student's needs in a class size of **25 students**?

_____	_____	_____	_____	_____
Strongly Agree	Agree	Neither Agree or Disagree	Disagree	Strongly Disagree

15. How strongly do you agree that you would be able to use small groups in your instruction in a class size of **25 students**?

_____	_____	_____	_____	_____
Strongly Agree	Agree	Neither Agree or Disagree	Disagree	Strongly Disagree

16. How strongly do you agree that more time is spent on instruction rather than discipline in a class size of **25 students**?

_____	_____	_____	_____	_____
Strongly Agree	Agree	Neither Agree or Disagree	Disagree	Strongly Disagree

17. How strongly do you agree that you could incorporate the use of computers and technology into your instruction with a class of **25 students**?

_____	_____	_____	_____	_____
Strongly Agree	Agree	Neither Agree or Disagree	Disagree	Strongly Disagree

Appendix J
Letter to School Administrators

Dear Title I School Administrator,

My name is Jennifer Murphy, and I am a doctoral student at Virginia Commonwealth University. I am currently investigating the effects of class size on the student achievement of Title I students. As a Title I teacher for many years, I have experienced various class sizes: smaller classes of 18 to 20 students, and larger classes of 25 to 30 students. Through my investigation, I am interested in seeing if the perceptions I gained through my teaching experience regarding class size are shared among other teachers in Title I schools.

My goal is to survey teachers in Title I schools regarding their perceptions of class size effects on student achievement. This survey is voluntary, and I am asking that teachers answer it anonymously. This is to ensure there will not be any identifying information. I will be delivering the survey to all teachers at Title I schools in the district along with a self-addressed envelope. There will be no way for me to identify individuals who answered the survey or from what school it will come.

By relating teachers' perceptions regarding class size at Title I schools to issues of classroom quality, this study sets out to identify instructional strategies to support program needs and may result in the provision of the most effective and meaningful educational experiences for students today and in the future. In an effort to collect as much data as possible, I am asking your permission to be able to put these surveys in the mailboxes of your teachers by _____, so that they may be returned by _____. If you could, please contact me by phone (804) ***-*** or email: *********** with your decision regarding the participation of your teachers in this survey. I recognize the busy schedules of teachers and administrators, and your assistance and participation would be greatly appreciated.

This study has been approved by the VCU IRB and the **** Department of Research and Planning. It is being conducted as part of a dissertation project and is not being conducted by Henrico County Public Schools. However, the results from the study will be shared with school system staff to inform best practices.

If you have any questions regarding this study, please feel free to contact me by phone (804) ***-**** or by email: ***********. Thank you in advance for your assistance in collecting this data.

Sincerely,

Jennifer S. Murphy

Appendix K
Cover Letter to Survey

Dear Title I Teacher,

My name is Jennifer Murphy, and I am a doctoral student at Virginia Commonwealth University. I am currently investigating the effects of class size on the student achievement of Title I students. As a Title I teacher for many years, I have experienced various class sizes: smaller classes of 18 to 20 students, and larger classes of 25 to 30 students. Through my investigation, I am interested in seeing if the perceptions I gained through my teaching experience regarding class size are shared among other teachers in Title I schools.

My goal is to survey teachers in Title I schools regarding their perceptions of class size effects on student achievement. This survey is voluntary, and I am asking that you answer it anonymously. This is to ensure there will not be any identifiable information. I have delivered this survey to all teachers at Title I schools in the district along with a self-addressed envelope. There will be no way for me to identify individuals who answered the survey or from what school it will come.

By relating teachers' perceptions regarding class size at Title I schools to issues of classroom quality, this study sets out to identify instructional strategies to support program needs and may result in the provision of the most effective and meaningful educational experiences for students today and in the future. In an effort to collect as much data as possible, I am asking you to participate in answering this survey and mail it back to me in the envelope I have provided. Again, this survey is voluntary. If you choose to answer this survey, please return it in the mail by _____. I would greatly appreciate your participation.

This study has been approved by the VCU IRB and the **** Department of Research and Planning. It is being conducted as part of a dissertation project and is not being conducted by Henrico County Public Schools. However, the results from the study will be shared with school system staff to inform best practices.

If you have any questions regarding this study, please feel free to contact me by phone (804) ***-**** or by email: **********. Thank you in advance for your assistance in collecting this data.

Sincerely,

Jennifer S. Murphy

Appendix L
Diagram of Classroom A:
Interactions and Field Notes

Chalkboard

PB

A

St 1	St 2
St 3	St 4

B

St 5	St 6
St 7	St 8

Table F

C

St 9	St 10
St 11	St 12

D

St 13	St 14
St 15	St 16

Table G

E

St 17	St 18
St 19	St 20

Computer Table

Teacher's Desk
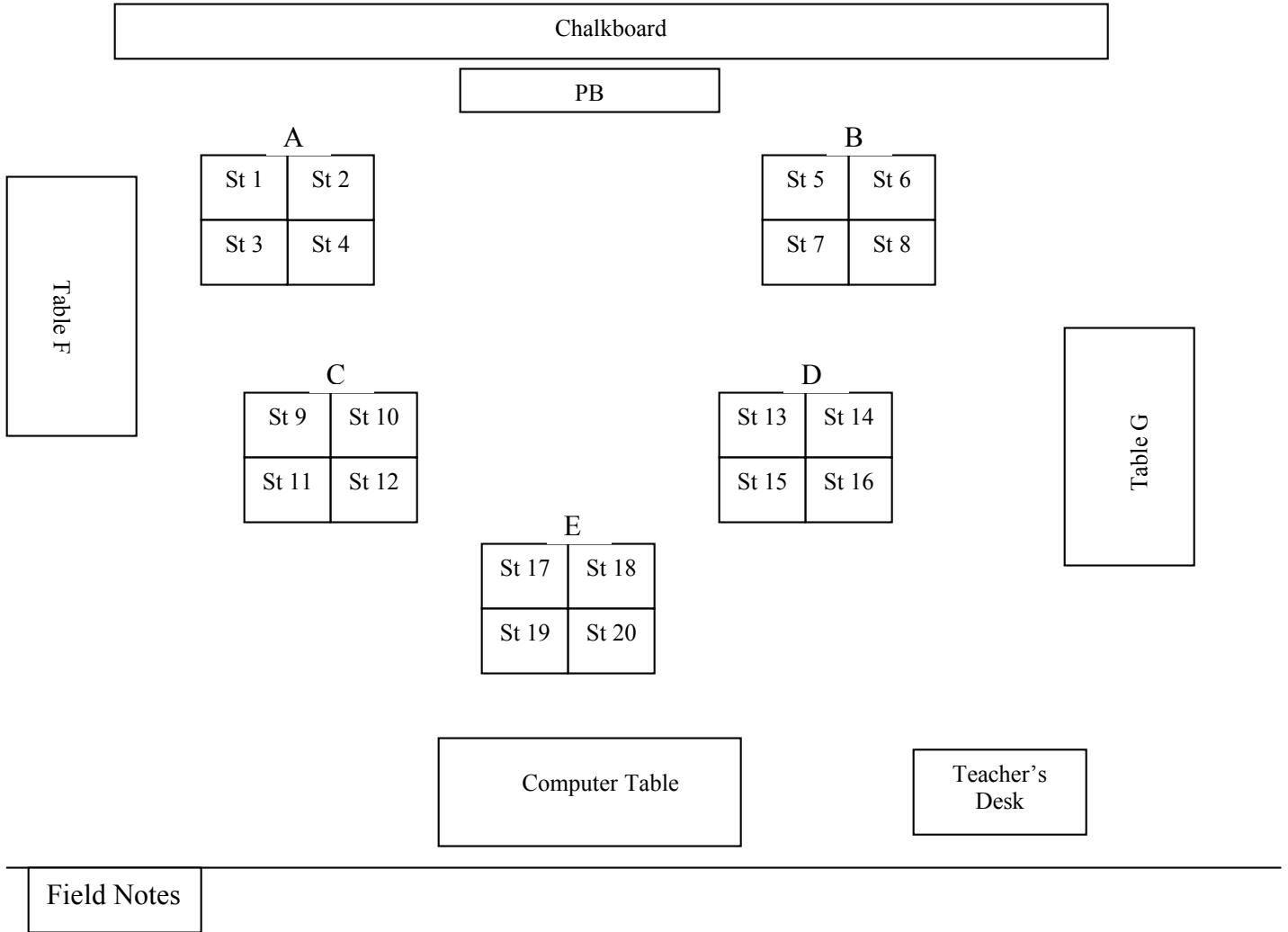
Field Notes

Appendix M
Diagram of Classroom B:
Interactions and Field Notes

Chalkboard

PB

A

St 1	St 2

B

St 3	
St 4	St 5

Teacher's Desk

Table I

C

St 6	St 7

D

St 8

E

St 9	St 10

F

St 11	St 12

G

St 13	St 14
St 15	St 16

Reading Center

H

St 17	St 18
St 19	St 20

Computer Table
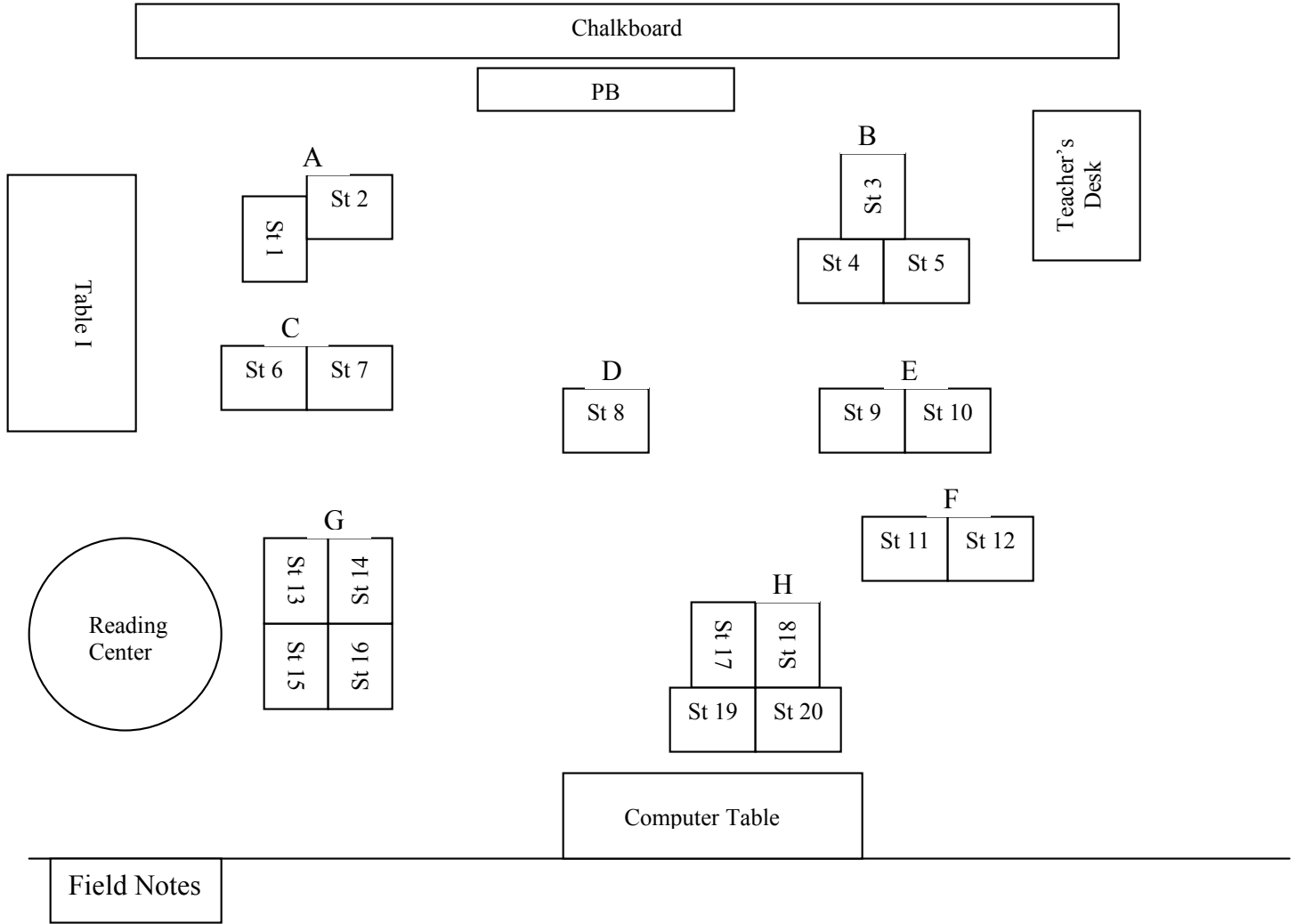
Field Notes

Appendix N
Diagram of Classroom C:
Interactions and Field Notes

Chalkboard

Teacher's Desk

A

B

Computer Table

C

D

E

Table F

Table G	Reading Center
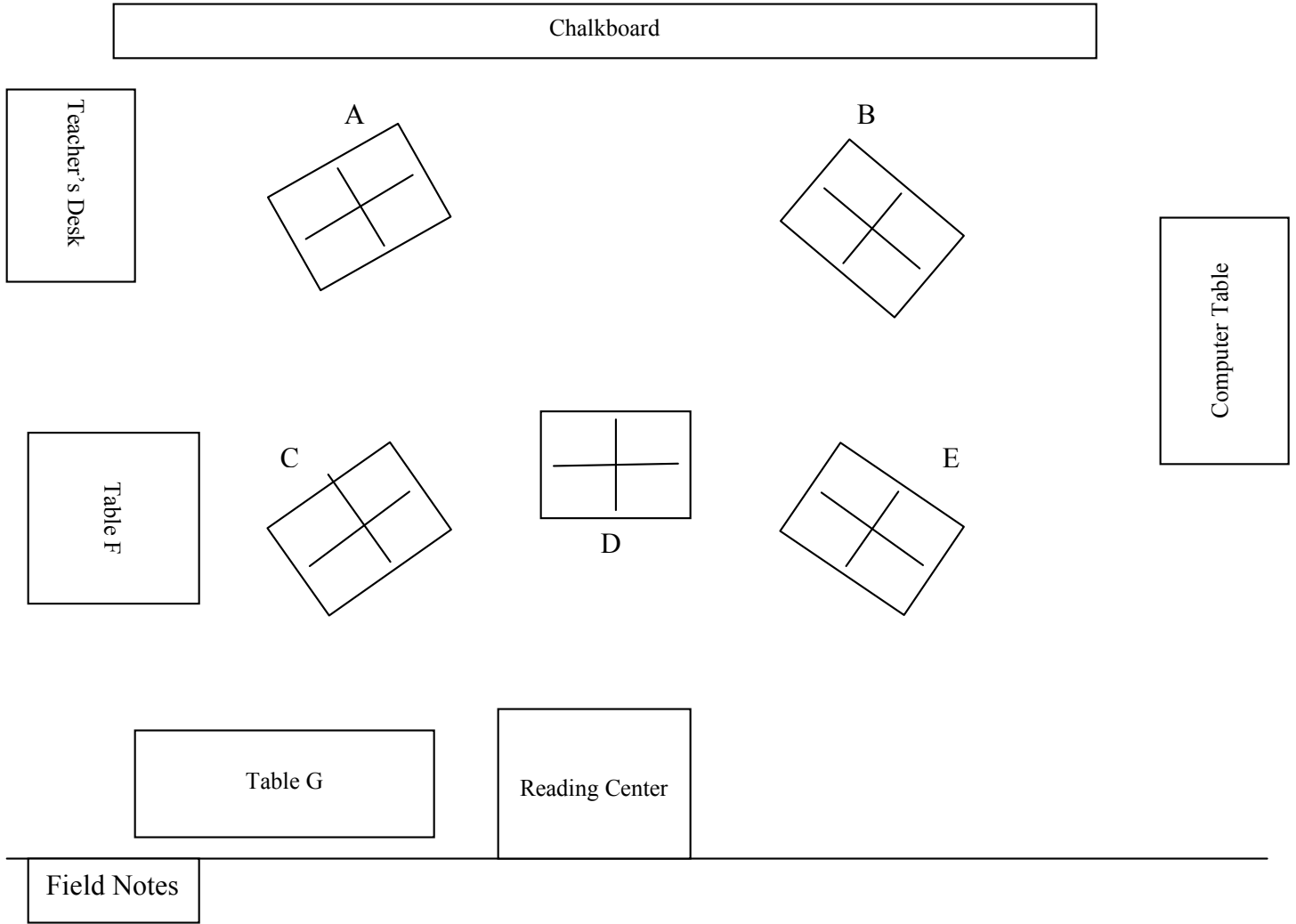
Field Notes

Appendix O
Diagram of Classroom D:
Interactions and Field Notes

Chalkboard

Teacher's Desk

A

St 1		St 2
	St 3	St 4

B

St 5		St 6
	St 7	St 8

C

St 9		St 10

D

St 11		St 12
	St 13	St 14

E

St 15		St 16
	St 17	St 18

Computer Table

Reading Center

Table F

Field Notes
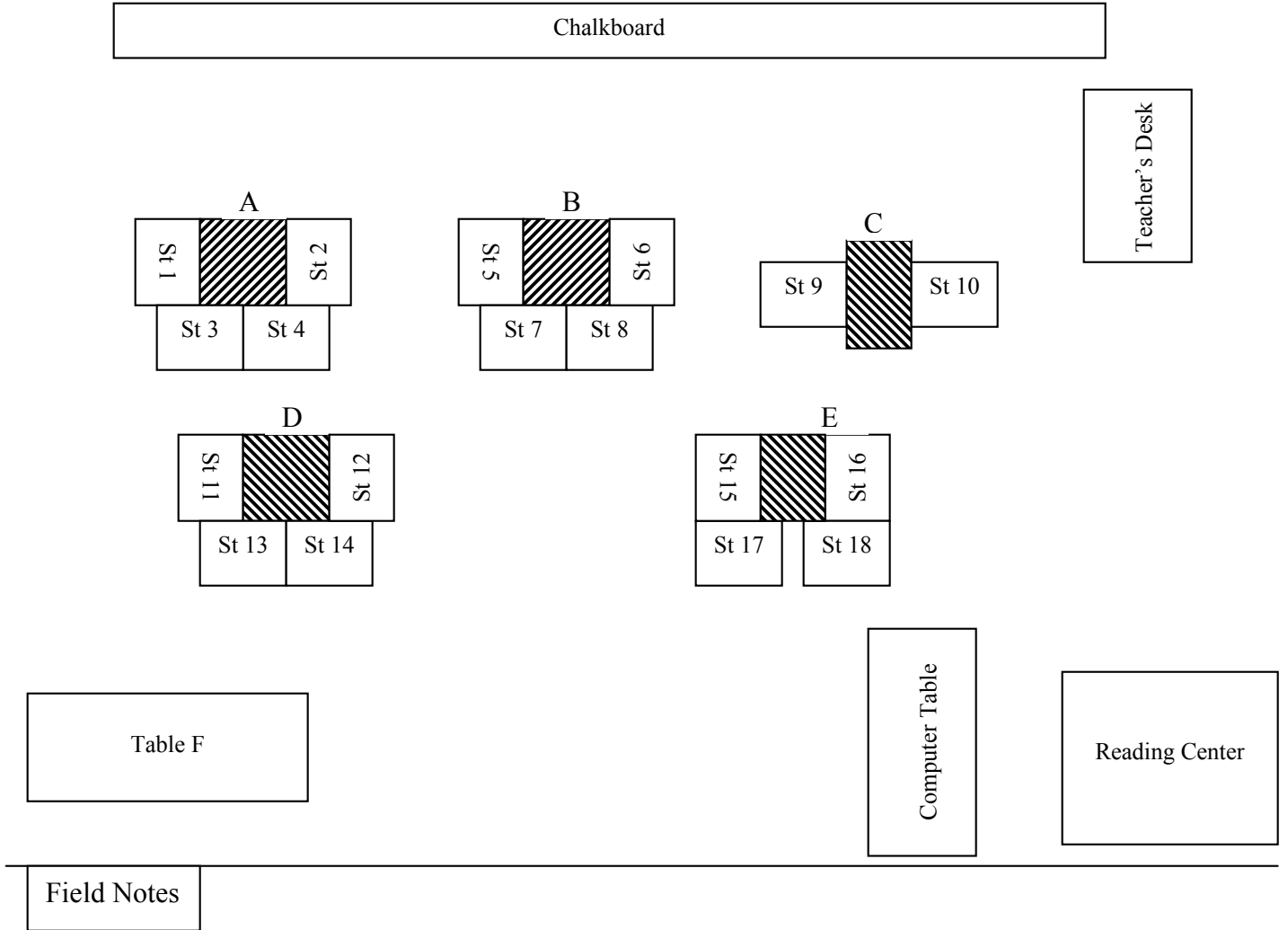
Appendix P
Email to School Administrators

Dear Title I Administrators,

Due to the inclement weather, I am sending you this follow-up email to the letter I sent last week seeking permission to distribute a survey to the teachers in your schools. I thought with the schools being closed, it might be easier for each of you to respond to an email. I am a doctoral student at Virginia Commonwealth University, and I am currently investigating the effects of class size on the student achievement of Title I students. As a Title I teacher for many years, I have experienced various class sizes: smaller classes of 18 to 20 students, and larger classes of 25 to 30 students. Through my investigation, I am interested in seeing if the perceptions I gained through my teaching experience regarding class size are shared among other teachers in Title I schools.

My goal is to survey teachers in Title I schools regarding their perceptions of class size effects on student achievement. This survey is voluntary, and I am asking that teachers answer it anonymously. This is to ensure there will not be any identifying information. I will be delivering the survey to all teachers at Title I schools in the district along with a self-addressed envelope. There will be no way for me to identify individuals who answered the survey or from what school it will come.

This study and survey have both been approved by the VCU IRB and the **** Department of Research and Planning. A copy of the VCU approval letter was enclosed with the letter. As a former Title I teacher with ******** County, I realize and appreciate how busy you and your teachers are at this time of year. This survey will only take a few minutes of their time, and any participation will be greatly appreciated. In an effort to collect as much data as possible, I would like to get the surveys to your teachers by February 8th so that they may return them by February 28th.

In an effort to meet that schedule, it would be most appreciated if you could please respond to this email by this Friday. Some of you have already responded, and I appreciate you taking the time out of your very busy schedules to do so. Thank you for your time.

Sincerely,

Jennifer S. Murphy

BIOGRAPHY

Jennifer S. Murphy was born May 24, 1979, as Jennifer Nicole St.Germain in Riverside, California. She moved with her family to Richmond, Virginia a year later. Jennifer grew up in Richmond and attended Virginia Commonwealth University where she received a Bachelor of Science degree in Psychology and a Master of Teaching degree in December 2002. She started her teaching career the following 2003-2004 school year at a Title I school in Central Virginia. In that same year, Jennifer was the First Year Teacher Award recipient at that Title I school. She taught Grade 3 for three years and was Grade Level Chair for two years, before moving to Grade 5. Starting in 2006, she became the Teach First Facilitator for Grade 5 for the school and worked to plan instructional development plans for the grade level. In the summer of 2007, Jennifer conducted research with the district's School Administration Office, exploring new recruitment techniques for the school district to implement in attracting diverse teacher candidates. She reported the findings of her research to the Assistant Superintendent of Administrative Services and the Director of Human Resources. Later in 2009, she was an Administrative Intern for the school district. In teaching at a Title I school, Jennifer loved working with such a diverse group of children. She maintained high expectations of all her students, and believed that every child, regardless of their background, could succeed.

In December of 2004, Jennifer married her husband, Kyle. The following year, in the fall of 2005, she started the doctoral program at Virginia Commonwealth University

in Educational Leadership. While finishing up her coursework, Jennifer and Kyle welcomed their first child, Nicole, into the world. Jennifer currently enjoys staying at home with their daughter, and she plans to return to education after her children start school. In the meantime, Jennifer completed her Doctor of Philosophy degree and graduated in 2010, and she plans to continue researching for publishing purposes.