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The Impact of Systematic Professional Development on Selected Areas of Student Performance in Selected Missouri School Buildings

Clifford J. Carver
University of Missouri-St. Louis, jcarver@mail.av.k12.mo.us

THE IMPACT OF SYSTEMATIC PROFESSIONAL DEVELOPMENT ON SELECTED AREAS OF STUDENT PERFORMANCE IN SELECTED MISSOURI SCHOOL BUILDINGS

by

CLIFFORD J. CARVER

B.S.Ed., Southeast Missouri State University, 1988
M.Ed., Southeast Missouri State University, 1992
Ed.S. Southeast Missouri State University, 1993

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Advisory Committee

Carole Murphy, Ed.D.
Chairperson
Doug Miller, Ph.D.
Ken Owen, Ed.D.
Lloyd I. Richardson, Ph.D.
Thomas Schnell, Ph.D.

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ABSTRACT

With the constraints under the No Child Left Behind Act, schools face the challenges of meeting extremely high standards with students. Recent research generally focuses on the role of professional development in school reform. Although a great deal has been written on the topic of professional development, the empirical literature on the topic is much less extensive. Few studies have actually documented its impact on student achievement.

The purpose of this study was to determine the impact of systematic professional development on selected areas of student performance in selected Missouri school buildings. This research study was quantitative in nature and geared toward aiding school districts in making well-informed decisions regarding the impact of professional development on student achievement. This study examined four reform grants that required professional development. These grants included the Reading First Grant, “enhancing Missouri's Instructional Networked Teaching Strategies” (eMINTS), Comprehensive School Reform, and High Schools That Work.

The Missouri Assessment Program and the American College Test scores were examined through univariate two-way analysis of variance of the differences in schools that participated in specific reform grants and those that did not participate. Achievement data gathered from all 524 Missouri school districts included the following: Missouri Assessment Program scores in third, seventh and eleventh grades in Communication Arts; third and seventh grades in Reading Proficiency; fourth, eighth and tenth grades in Mathematics, and the American College Test composite scores. Where initial significance was not found, an analysis of variance was used to study effects for the

independent variables of enrollment, free and reduced lunch percentage and per pupil expenditure.

The study found a number of significant interactions. A primary finding was the strong correlation between the Reading First grant and its impact on third grade Communication Arts and Reading Proficiency MAP scores.

The results of this investigation have implications for all educators and school districts involved in professional development and reform. This research could assist educators in selecting reform models that require staff development programs that impact student achievement.

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CHAPTER 1

INTRODUCTION

Throughout the past century, continual concern with the educational environment has led to numerous reform movements. Dramatic changes in education began in the United States to enhance student performance and to prepare children for the future. In addition, these changes aimed to equip teachers with activities to provide quality education in order to address national and public expectations and concerns. Within the past 25 years, the growing concern for student achievement and teacher preparation has become the main focus in both the educational and political arenas.

Starting with “A Nation At Risk” in 1983, and continuing with the National Education Goals of 1990, the Missouri Outstanding Schools Act of 1993, Goals 2000 of 1994, and of the most recent federal law, No Child Left Behind Act of 2001, education and student achievement have been targets for reform. Of the many issues addressed under these legislations, one issue in particular relates to the preparation and development of educators and its impact on student achievement.

Student achievement and teacher development remain a growing concern even with the most recent passage of the No Child Left Behind (NCLB) federal law. Increased and intentional student achievement is the ultimate goal for every school district. High quality instruction, along with curriculum and teacher preparation, is the catalyst for achieving this goal. However, the alignment of quality instruction, curriculum, and school climate can be incoherent unless there are individuals assessing the health of the school and making decisions for ways to improve. According to Guskey (2000), one of the most critical reform challenges schools face today can be expressed simply: If

teachers are to teach all students successfully to high standards, virtually everyone who affects student learning must be learning virtually all the time. How can it be that something universally recognized as so important can also be regarded as so ineffective? Many of the difficulties in obtaining student achievement can be linked to the lack of solid, sustainable staff development or a professional development system. Guskey (2000) defines professional development as “those processes and activities designed to enhance the professional knowledge, skills, and attitudes of educators so that they might, in turn, improve the learning of students”. Since the passage of NCLB, the broad understanding and definition of professional development has been modified to require that teachers receive high quality professional development.

Over the past several years, researchers have tried different approaches to identify issues related to the effectiveness of professional development. Some researchers have tried to isolate reliable factors, while others have tried to distinguish elements related to successful program implementation. Despite these efforts, specific answers tend to be elusive.

This research is directed toward selected public school buildings in Missouri that have received specific grants which require systematic professional development of staff members to generate successful educational change and increased student achievement. For the purpose of this research, the following grants will be examined: the Comprehensive School Improvement (CSR), High Schools That Work (HSTW), Reading First (MORF), and “enhancing Missouri's Instructional Networked Teaching Strategies” (eMINTS) grants.

Despite utilizing a more systematic professional development program, problems continue to plague some districts in the areas of academic achievement. The obvious solutions appear to increase student performance, provide a better school environment, and enable teachers to benefit from systematic professional development. Even with the new knowledge relating to sustained efforts, many districts continue to provide one-shot, drive-through professional development activities. With more rigorous state standards and the reality of required Adequate Yearly Progress federal standards, districts must find successful ways to make necessary changes or risk not meeting state and federal performance standards. Many school districts have had difficulty adapting to change and making the necessary decisions to provide a better and more productive educational environment for students and staff.

Purpose of the Study

The purpose of this study is to determine what impact, if any, exists between select Missouri school districts that implement systematic professional development activities and the improved achievement of their students. More specifically, this study will focus on the academic areas of the Missouri Assessment Program (MAP) test including mathematics, communication arts, reading proficiency, and the American College Test (ACT) scores. The effort toward excellence must include improvement of instruction through professional development. In addition, the research will attempt to answer the following research questions:

1. What are the perceptions of the stakeholders on current staff development programs in schools?

2. What types of professional development activities appear to have the greatest impact on student achievement?
3. When implementing professional development programs, how do building enrollment size, building free and reduced lunch percentage, and district per pupil expenditure affect student achievement?

Currently, few studies have been able to clearly link the effects of the professional development initiatives to student achievement. Because of disparities in every district, research is vague as to whether a sustained professional development program has had a direct impact on student achievement.

Hypotheses

The hypotheses focus on a reflection of the literature review and the assumption that long-term positive effects are achievable in programs through the utilization of professional development. In order to determine the overall relationship of professional development to selected areas of student performance in Missouri school districts, the proposed hypotheses are as follows:

1. There will be no significant difference in student achievement in school buildings that implement funded systematic professional development programs for educators in the areas of mathematics, communication arts, third and seventh grade reading, and ACT scores than in those that have one or no funded projects.
2. There will be no significant difference in student achievement in buildings that implement multiple funded projects or grants that require sustained professional development than in those that have one or no funded projects.

Delimitations

In order to obtain data to support the above statement of the problem, the proposed study maintains the following delimitations:

1. This study will be limited to select public school buildings in the state of Missouri.
2. This study will be limited to those school buildings that have been awarded at least one of the following grants: CSR, HSTW, MORF or eMINTS.

Limitations

In addition to the delimitations, the proposed study entails the following limitations:

1. Only five years (2000-2005) of data will be used from state achievement tests.
2. Percentage of expenditures varies from district to district; therefore, some districts may spend substantially more funds for professional development than others.
3. By using the MAP test and ACT college entrance exam, the reliability and validity of the measuring instruments are undeniable.

Definitions of Terms

For the purposes of this research, the following definitions will apply to the information obtained through review of literature based on professional development:

Annual Performance Report refers to a report that a district receives from the Missouri Department of Elementary and Secondary Education which shows how the district is performing on achievement tests, ACT scores, dropouts, attendance, vocational completers, and placements.

Elementary School refers to any building with a combination of any grades kindergarten through sixth.

Free or Reduced Price Lunch Eligibility (F/R Lunch) refers to the percentage of students in a district eligible for free and reduced meals through the National School Lunch Program (NSLP).

High School refers to any building with a combination of any grades ninth through twelfth.

Middle School refers to any building with a combination of any grades fifth through eighth.

Missouri Assessment Program (MAP) refers to a series of examinations designed to assess how well Missouri students are learning knowledge, skills, and competencies defined in the state's academic standards. District performance is reported as the percentage of students scoring in each of five proficiency levels. District performance measures include the percent of test takers scoring in the top two proficiency levels, the percent of students performing in the bottom two proficiency levels, and a MAP Index score that reflects the distribution of student scores across all five proficiency levels.

Outstanding Schools Act (SB380) refers to legislation passed in 1993 that addresses issues of educational quality in the state of Missouri, in particular, the raising of standards for students, teacher education programs, and funding inequalities in response to a Missouri state court decision.

Professional Development is defined as those processes and activities designed to enhance the professional knowledge, skills, and attitudes of educators so that they might, in turn, improve the learning of students (Guskey, 2000).

Sustained Professional Development refers to a continuous process of improvement to promote high standards of academic achievement and responsible citizenship for all students.

Systematic Professional Development refers to a systematic maintenance, improvement and broadening of knowledge and skills, and the development of personal qualities necessary for the execution of professional duties throughout working life.

Significance of the Study

Over the past century, several reform movements have had little impact on professional development and its connection to the educational achievement of children. The report "A Nation At Risk" had implications that stressed ill-prepared teachers, but no significant results of the outcomes. Goals 2000 actually showed a decrease from 66 percent to 63 percent in teacher professional development involvement from 1991 to 1994. 1n 1994, 85 percent of teachers reported that they participated in various in-services or professional development programs on one or more topics (National Education Goals Panel, 1995, p. 42). Over the past several years, millions of dollars have been designated and spent for professional development, yet no solid support validates that it has truly affected increased student achievement. However, with the passage of the Missouri Outstanding Schools Act, the state of Missouri plans to continue providing programs and initiatives for professional development in order to increase student achievement.

The majority of the previous studies related to professional development has focused on program outcomes for the success of students and has not connected

professional development with increased student improvement. Other reports have stated that schools are not providing professional development in all areas needed as a result of the national goals. The intent of the present study is to scrutinize the literature and show a direct impact between systematic professional development and increased student achievement.

Summary

This chapter includes the following components: (1) an introduction to the study, (2) the purpose of the study, (3) the statement of hypotheses, (4) delimitations of the study, (5) limitations of the study, (6) definitions of terms, and (7) significance of the study.

The passage of Goals 2000 by Congress, the Outstanding Schools Act (SB380) in Missouri, and the federal law No Child Left Behind Act of 2001 has given increased emphasis on teacher development and its role as an essential component of achieving student success and excellence. Teacher preparation is more extensive than just preparation in college teacher education programs. Preparation includes continuous skill development from the teacher's recruitment to retirement. If students are to perform well, it is paramount that teachers perform well in providing the necessary academic skills. These academic skills are imperative in the fostering of intellectual growth and helping students become independent learners. Therefore, there must be a clear vision of excellence in performance so that educators know how to work toward the vision. The effort toward excellence must include improvement of instruction through sustained professional development.

While the first step in professional development is evaluation, the intent is also to help everyone move beyond concerns about competency and focus on the more desirable goal of continual improvement and professional support. By moving beyond evaluation, teachers can ensure the academic success of each child who enters public schools today, tomorrow, and into the future.

Literature related to professional development and reforms over the past forty years that provide pertinent information concerning professional development programs are reviewed in Chapter 2. In addition, Chapter 2 contains important historical information about the events leading to the creation and implementation of professional development programs not available in the current literature.

CHAPTER 2

REVIEW OF SELECTED LITERATURE

Introduction

The major goals of all public schools are student success and achievement. However, in order to accomplish these tasks, educators must be well prepared. According to Miles, active learning by children requires active learning by teachers (Guskey & Huberman, 1995). Educators must continuously engage in learning to meet the demands of state and federal guidelines, and to prepare a rapidly changing student population. Quality professional development is complex and diverse. Thus, a clear focus on professional development is the key to building the capacity of educators to make school reform happen and to sustain it over time. However, according to Reitzug (2002), when most educators hear the words "staff development" they associate them much more narrowly with only workshops and in-services. Likewise, Miles (Guskey & Huberman, 1995) states that "a good deal of what passes for 'professional development' in schools is a joke---one that we'd laugh at if we weren't trying to keep from crying" (p. vii). He goes on to state that "current professional development is radically under resourced, brief, not sustained, designed for 'one size fits all,' imposed rather than owned, lacking any intellectual coherence, treated as a special add-on event rather than as part of a natural process, and trapped in the constraints of the bureaucratic system we have come to call 'school'" (p. vii). Unfortunately, the narrow understanding many educators have of staff development mirrors staff development practices in most schools and districts in the United States. It is also important to keep in mind that presently more is known about

professional development processes that fail than those that succeed (Gall & Renchler, 1985; Showers, Joyce, & Bennett, 1987).

This section will discuss the findings from related literature as it pertains to this research. For purposes of this study, the literature will deal with the definition of professional development, the historical perspective of the research, the theoretical perspective of the research, and the legislative directives. In addition, the literature will examine the philosophical changes that have occurred over the past several years, the shifts in professional development, and case studies that have tried to link professional development with student achievement. This section will also discuss the reform grants identified for this study and will conclude with a brief summary.

Definitions of Professional Development

In the educational profession, educators have often interchanged the terms professional development, in-service training, and staff development in order to describe continued education. According to Stout (1996) staff development-sometimes called continuing education, in-service training, or professional development-is defined as a central tool for altering teacher behaviors. Jones and Lowe (1990) also referred to "staff development as a continuing process that changed a teacher's practice. It should involve examining assumptions about teaching, learning, and the subject matter" (p. 8). In addition, they stated "Staff development should offer practices that provide new techniques, strategies, methods, and approaches with feedback in a non-threatening environment". Mizell (2003) suggested that staff development is a process in which learning opportunities are created for teachers, resulting in students receiving the benefits

from the teacher's new knowledge. If this approach is taken seriously and staff development is perceived as a sequential process that starts with educating teachers, then student achievement should follow.

Guskey (1986) described staff development programs as "a way in which to alter the professional practices, beliefs, and understanding of school persons toward an articulated end" (p. 5). He cited the end as being student learning. Therefore, staff development programs should bring about change in a teacher's classroom and beliefs, thus resulting in added student learning (Guskey, 1986).

Burke (2000) stated "Professional development from a school system's point of view is a planned, comprehensive, and systemic program designed by the system to improve all school personnel's ability to design, implement, and assess productive change in each individual and in the school organization" (p. 29). Districts often experience disappointment by wasting thousands of dollars on workshops and conferences that fail to lead to significant change in practice when the teachers return to their classrooms.

In reviewing the literature, the most common definition of professional development suggested an on-going, in-depth, and intensive program which should be research and data driven. Designed with teachers and students in mind, staff development should bring a significant change within the educational program resulting in teacher growth and student achievement.

Historical Perspective

Over the years, researchers have tried different approaches to reveal issues related to the impact of professional development and student achievement. Teachers' quests to improve themselves professionally have been previously burdened with roadblocks.

Historically, educators received their professional development through university teacher training programs that developed their knowledge and skills. After graduation from the teacher training institutions, teachers were left to come up with their own professional learning. Teachers had the choice of finding and attending workshops, continuing advanced university study, or reading educational journals about new concepts and practices in teaching. Until about the 1950s, according to Speck and Knipe (2001), teachers were left to pursue professional learning whenever and wherever they could at the teacher's expense. Schools and districts were not concerned with the development of their teachers as long as teachers fulfilled the requirements of their teaching positions.

In 1957, the Soviets launched the Sputnik and Americans began to realize that it was critical for them to support education and educators, especially in the areas of science and mathematics. The National Defense Education Act, funded during the 1960s, created opportunities for teachers in a new kind of professional learning that helped them improve their work. Because the goals to improve science and math programs were very clear, districts were more focused in providing professional development opportunities. In addition, summer training institutes were initiated to inform teachers of current research, however, few teachers attended. Those teachers that attended returned to

classrooms where they had little support for implementation (Speck & Knipe, 2001, p. 207).

The 1970s saw the increased use of individual, episodic professional development activities by schools and districts. These activities included attendance at conferences, keynote speakers, workshops, seminars and "make it and take it" sessions over a wide variety of curriculum and instructional areas. According to Speck and Knipe (2001), the one-day, episodic professional development events were generally required of all teachers, mandated by a district or school. Teachers were not consulted about their depth of understanding pertaining to the topic or reflection on the impact of their classroom. Generally, there were no follow-up professional development activities or discussions following the events. Many teachers saw these types of activities as "flash and dash" or "dog and pony shows" that a district or building administrator had seen at a conference and thought it would be good to share with teachers in the district (p. 208).

Professional development at this stage had very little significance for teachers. Instead, it instilled a feeling that as a professional, they could not determine their own professional development. Sparks and Hirsch (1997) describe this type of professional development as teachers...sitting passively while an "expert" exposes them to new ideas or "trains" them in new practices, and the success of the effort is judged by a "happiness quotient" that measures participants' satisfaction with the experiences in addition to their off-the-cuff assessments regarding its usefulness.

By the 1980s, educators began to look at research on the relationship between teacher learning and aspects of coaching. Professional development began to change from periodic events into a series of workshops or seminars focused on content knowledge and

teaching strategies. Teachers began to be involved with an ongoing learning process which dealt with collegial support, reflection and continuous improvement through collaboration and sharing.

In the 1990s, according to Speck and Knipe (2001) educators clearly recognized the need to emphasize the central role of professional development interwoven with the organizational development of schools. The importance of systems thinking and of the interrelationships of individuals to the whole organization, and vice versa, began to be seen. Fragmented approaches to change based on fads, and onetime, piecemeal approaches, had to be replaced by a systematic, coherent plan for professional development and organizational change (Fullan, 1991; Sarason, 1991). The focus on central office professional development was moved to a school-based focus to have the greatest impact. Central office professional development departments began changing their approach to assisting schools with ongoing support, site-level coaching of individuals and teams, and facilitation of new knowledge and programs. With the standards movement, student needs and learning outcomes emerged as the key focus, rather than adult needs.

Although recently developed induction and internship programs have altered things somewhat (Burden, 1990), the professional development experiences of teachers have remained much the same for the past three or four decades.

Theoretical Perspective

Systems thinking teaches that individual learning and organizational changes must occur concurrently and support one another if the gains made in one area are not to

be eliminated by continuing problems in another. According to Supovitz (2001), high quality professional development will produce superior teaching in classrooms, which will in turn translate into higher levels of student achievement. Too often school districts have believed unrealistic hopes that dramatic changes would occur in schools as a result of staff development programs designed to help individual teachers and administrators. These programs are built on the assumption that improved performance will be achieved when individuals learn how to improve their jobs. Rather than basing professional development solely on the teacher's needs, staff development planning processes are more often beginning by determining student's needs, and by working backwards to the knowledge, skills, and attitudes that educators must have if those student outcomes are to be realized. This shift does not contradict the value of teachers' perceptions regarding their needs, but rather places those needs within larger context.

In addition, this shift recognizes that the ultimate criterion against which systemic change efforts must be judged is their effect on student learning. It is no longer sufficient to judge the value of staff development efforts by gathering information on participants' satisfaction with those efforts (Sparks & Hirsh, 1997). On the other hand, it will no longer be permissible to hold staff development solely responsible for improvement in student outcomes. Student outcomes are the result of complex interactions of the various parts of the system and that all these parts must be critically examined to determine their influence on one another and on student learning.

Job-embedded staff development means that all administrators and teacher leaders should see staff development as a major responsibility performed throughout the school system.

Legislative Directives

For many years, educators and researchers have discussed which school factors influence student achievement. As policymakers become more involved in school reform this issue becomes more important since many of their directives assumed relationships between educational factors and student learning outcomes (Darling-Hammond, 2000).

In 1981, Secretary of Education T.H. Bell created the National Commission on Excellence in Education to examine the quality of education in the United States. As a result of the investigation, the commission published a report entitled "A Nation At Risk" in April 1983. This report claimed that American students: (1) were not studying the right subjects, (2) were not working hard enough, and (3) were not learning enough, (4) that their schools suffered from slack and uneven standards, and (5) that many of their teachers were ill-prepared (Finn, p. 17).

Since the release of "A Nation At Risk" (National Commission on Excellence in Education, 1983), hundreds of commission reports have been issued and thousands of pieces of legislation have been passed to try to redesign schools so they can prepare a more diverse student population to learn at much higher levels. In just over a decade schools have experienced reforms that sought to raise achievement through courses and testing mandates (Speck & Knipe, 2001).

Concerns about the education system continued, and in 1990, President George H.W. Bush and the nation's governors, established the National Education Goals that were designed to impact the future of education. These goals consisted of eight major components with the intent to accelerate progress and impact student achievement. One of the goals, in particular the fourth, addressed the need for teacher in-service and career

development. The fourth goal stated, “By the year 2000, the Nation’s teaching force will have access to programs for the continued improvement of their professional skills and the opportunity to acquire the knowledge and skills needed to instruct and prepare all American students for the next century” (National Education Goals Panel, 1991, p. 11).

In 1993, the Missouri Outstanding Schools Act, Senate Bill 380 (SB380) was created. This legislation addressed issues of educational quality, specifically the raising of standards for students and for teacher education programs and the creation of sources for quality professional development. The provisions of the bill addressing teacher education called for a statewide evaluation of teacher education programs. The provision addressing professional development required schools to allocate one percent of basic state aid funds to professional development.

In 1994, based on the previous National Education Goals, a new program was established under the Clinton Administration. The new program, Goals 2000, restated the strong focus on the implementation of an alignment reform to foster student achievement and also stated that the instructional system must support fulfillment of those expectations. According to the Goals 2000 report to Congress, school improvement efforts needed to include broad parent and community involvement, school organization, coordinated resources--including educational technology, teacher preparation and professional development, curriculum and instruction, and assessments--all aligned to agreed on standards (U.S. Department of Education, Goals 2000).

The most recent legislative directive, a federal law entitled No Child Left Behind Act of 2001 (NCLB), went into effect with the purpose of increasing student achievement by elevating teacher and principal quality through recruitment, hiring, and retention

strategies. The program uses scientifically based professional development interventions and holds districts and schools accountable for improvements in student academic performance. This program was created because research shows that teacher quality is correlated with student academic achievement (Sanders & Rivers, 1996). In addition, part of the law requires school districts to meet a determined student achievement called Adequate Yearly Progress.

The development of professional development systems does not take place unless policymakers believe there is a link between the investment in staff development and the learning of children. Given the mandate to transform schools, educators clearly recognize the need to emphasize the central role of professional development. Professional development has to play a key role in school reform efforts if reform efforts are to succeed and be sustained. This is essential if all students are to achieve high standards.

Shifts in Professional Development

The field of professional development is evolving gradually from a patchwork of courses and workshops into a system ensuring that educators regularly enhance their academic knowledge, professional performance, and images as professionals. States, school districts, and educators have been searching for ways to increase the investment in professional development and encourage styles that promote increased student achievement.

There are many forms that professional development may take and these formats have shifted over the years. According to Sparks and Hirsh (1997, p. 12), the major shifts

in professional development mentioned below are based on what is conceived and implemented.

a) From individual development to individual development and organization development

b) From fragmented, piecemeal improvement efforts to staff development driven by a clear, coherent strategic plan for the school district, each school, and the departments that serve schools

c) From district-focused to school-focused approaches to staff development

d) From a focus on adult needs and satisfaction to a focus on student needs and learning outcomes, and changes in on-the-job behaviors

e) From training conducted away from the job as the primary delivery system for staff development to multiple forms of job-embedded learning

f) From an orientation toward the transmission of knowledge and skills to teachers by “experts” to the study by teachers of the teaching and learning processes

g) From a focus on generic instructional skills to a combination of generic and content-specific skills

h) From staff developers who function primarily as trainers to those who provide consultation, planning, and facilitation services as well as training

i) From staff development provided by one or two departments to staff development as a critical function and major responsibility performed by all administrators and teacher leaders

j) From staff development directed toward teachers as the primary recipients to continuous improvement in performance for everyone who affects student learning

k) From staff development as a "frill" that can be cut during difficult financial times to staff development as an indispensable process without which schools cannot hope to prepare young people for citizenship and productive employment.

The shifts above are significant and powerful and have evolved over time. These changes are important lessons learned from the past and without these changes schools cannot improve. In other words, schools must see these changes as a combination of individual and organizational processes. Therefore, professional development processes, regardless of their forms, must be relevant to teachers, and must directly address the specific needs of students.

Research Studies

Although a great deal has been written on the topic of professional development, the empirical literature on the topic is much less extensive. This is particularly so when only studies that link professional development and student achievement are considered. According to Reitzug (2002), much of the research empirically linking professional development to specific outcomes has not appeared in the major referred scholarly journals, but has, as often as not, appeared in ERIC research reports, or in reports produced by school districts, foundations, or other organizations. Although the main objective of professional development is improving student achievement, as a result of increased teacher learning, testing the relationship between professional development and student achievement is difficult.

Research supporting the benefits of effective teacher professional development has become highly sought after in light of the focus on highly qualified teachers in the No

Child Left Behind (NCLB) Act of 2001. At least 100 studies in the past decade have documented that highly skilled, highly effective teachers help students learn. Teachers who are well prepared and trained are more effective in the classroom and therefore, have the greatest impact on student learning (Killion, 1999). We also know that the best way to increase teacher effectiveness in the classroom is through regular, high quality professional development. Teachers themselves report that the more time they spend in professional development activities, the more likely they were to indicate that it had improved their instruction (Killion, 1999; National Center for Education Statistics, 2001). One study also identified two important factors that influence the impact of professional development on teaching--the extent to which teachers felt that their professional development was linked to other program activities at the school, and whether the professional development activity was followed up with school-based activities (NCES, 2001). Researchers also agree that the success of school improvement and reform initiatives hinges, in large part, on the qualifications and effectiveness of teachers (Killion, 1999; Garet, Porter, Desimone, Birman, & Yoon, 2001).

Professional development activities can also be linked to increased student achievement. The National Staff Development Council (NSDC) identified 26 staff development programs for middle grades teachers with documented evidence to demonstrate the link between staff development and increased student achievement (Killion, 1999). Further evidence linking professional development to student achievement can be found in a 1998 study involving a half million elementary and middle grades students in 3,000 Texas schools. Researchers found that the most important factor in student achievement was teacher quality (Hanushek, Kain, & Rivkin, 1998). A national

study of over 1,000 mathematics and science teachers found similar results. Sustained and intensive professional development is more likely to have an impact on enhanced teacher knowledge and skills, and ultimately student achievement, than shorter professional development activities (Garet et al., 2001). The results from this study also indicated that professional development that is focused on subject matter, provided teachers with opportunities for "hands-on" work, and is integrated into the daily life of the school was more likely to produce enhanced knowledge and skills that positively impact student achievement.

A Texas study of 900 districts conducted by Ronald Ferguson of Harvard University found that teacher expertise (as measured by teacher education, licensing examination scores, and experience) explains 40 percent of the difference in student achievement in reading and mathematics. Ferguson's study also reveals how teacher quality can be improved; every dollar spent on more highly qualified teachers produced greater increases in student achievement than a dollar spent on any other single program (NCES 1997 citing Ferguson 1991). Similarly, a Boston study by Bain and Company found that students of the top third teachers produced gains on math tests that exceeded the national median while the bottom third showed virtually no growth. A study of schools in New York City found that differences in teacher qualifications accounted for 90 percent of the variation in student achievement in reading and mathematics (Armour-Thomas, Clay, Domanico, Bruno, & Allen, 1989). The evidence showing the influence of quality teachers is so overwhelming that the National Commission on Teaching and America's Future (NCTAF) called for a nationwide commitment to provide every child with a caring and competent teacher (NCTAF, 1996). Even Eric Hanushek, the

University of Rochester economist who frequently writes that school spending does not have much impact on student achievement, admits that "the difference between a good teacher and a bad teacher can be a full level of achievement in a single year" (Haycock, 1999).

By taking the more than three million teachers aleady in schools and helping them become more effective, staff development can produce immediate gains in teacher quality. For example, a 1998 study by Cohen and Hill at the University of Michigan found a relationship between teacher participation in curriculum workshops and scores on California's state assessment, even when controlling for teachers' past learning. Sustained participation in professional development activities tied to California's elementary school mathematics curriculum successfully improved teacher's knowledge of mathematics and their ability to transfer this knowledge to students. This effect was even higher when the professional development included information about the test (Cohen & Hill, 1998). The National School Boards Foundation even called investment in teacher learning, "the primary policy lever that school boards have to raise student achievement" (National School Boards Foundation, March 1999).

Reform Grants

Historically, the federal government, along with states and local boards shared responsibility for funding education. In the 1960s, the federal government got involved in funding special programs aimed at equalizing educational opportunities. Support for professional development of teachers was embedded within this structure of public funding. This pattern of public support continued through the 1980s and with the

publication of “A Nation at Risk” aimed at the need for a more thorough professional development system for educators. Early in the reform movement, states began to focus on student outcomes without adequate teacher development. Initially, federal policymakers began to argue that state and federal policy should focus on outcomes, such as student achievement, rather than inputs (Finn, 1990). State policymakers soon began to adopt this same position, linking their funding to outcomes through an emphasis on accountability (Choy & Ross, 1998). The state encouraged schools to develop plans for school improvement and federal and state monies were provided for these efforts through federal and state programs.

In the past few years, the idea of specifically linking professional development to educational outcomes has emerged from a number of reform movements or grants. Most of the reform movements have been building specific rather than district specific. Although district-focused approaches to staff development are beneficial for districts, more defined building specific professional development is aimed at helping schools meet their improvement needs. Therefore, more learning activities are designed and implemented by school faculties, with the district’s staff department providing technical assistance and functioning as a service center to support work of individual schools.

In recent years, various state and federal grants have concentrated on providing funding for programs based on a sustained and systematic professional development system. The premise behind each of these grants is that districts must hold a clear, sustained, systematic focus on specific areas for improving student learning over three to five years for lasting change to occur and improvement to be shown. If learning and

professional growth are supported and reinforced, there cannot be a year-by-year change of focus.

Numerous reform grants have emerged with the intention to systematically improve student outcomes. These grants have generally been in the forms of two primary designs, which are systematic schoolwide restructuring or systematic approach for specific reforms. More specifically, grants which have a systematic schoolwide restructuring design are those which are based on a recommended list of research-based programs that are intended to support professional development as a means of school district improvement. Specific reform grants are designed to help integrate specific approaches to staff development that focus on improvement of student or building outcomes. Grants that are based on these designs are grounded with a strong component of a sustained, systematic professional development program or process. Among the grants that fit into these two categories are the “enhancing Missouri's Instructional Networked Teaching Strategies” (eMINTS), Comprehensive School Improvement (CSR), High Schools That Work (HSTW), and Reading First (MORF). The success of each of these grants is based on specific professional development requirements and, in most instances, requires a buy-in of the majority of the teachers.

The eMINTS grant represented a statewide expansion of the Multimedia Interactive Networked Technologies (MINTs) program that began in 1997 through a cooperative effort of Missouri's Department of Elementary and Secondary Education (DESE), the Missouri Research and Education Network (MOREnet), Southwestern Bell and twelve elementary classrooms in six St. Louis County school districts. Because of the promising results of the MINTs program and the state’s desire to build momentum for

integrating technology into overall school improvement efforts, DESE rapidly expanded the program statewide in the Fall, 1999. To expedite the eMINTS expansion for 1999-2000, DESE selected the first set of districts by identifying districts that represented a cross section of Missouri's schools. Since then, districts have submitted competitive applications to DESE requesting participation; selection has been based on multiple criteria. Currently 22,500 students in grades 3 - 12 are learning in more than 1,200 eMINTS classrooms in 232 school districts throughout Missouri; in more than 75 MINTS classrooms across 10 Utah districts; in more than 65 classrooms in 60 Maine districts; and in classrooms in East St. Louis, IL and Corning, AR.

Professional development is one of the main components of the eMINTS program. Each eMINTS teacher participates in more than 250 hours of ongoing professional development during a two-year period. These hours occur mainly after school; districts compensate teachers for their out-of-contract time. Professional development sessions are followed by in-classroom visits and support from a highly qualified instructional specialist who lives in the teacher's geographic area. The professional development sessions are supplemented by instructional specialists who coach and support eMINTS teachers in their classrooms. Each eMINTS classroom is equipped with a teacher computer and laptop, a scanner, a color printer, a digital camera, an interactive whiteboard (SMART board), a high lumen projector and one computer for every two students. In addition, an eMINTS National Center was formed to provide a number of resources for teachers (Huntley & Greever-Rice, 2007).

The Comprehensive School Reform (CSR) Program began in 1998 and was authorized as Title I, Part F of the Elementary and Secondary Education Act, which was

signed into law on January 8, 2002. The CSR Program is an important component of the No Child Left Behind Act. The purpose of the grant is to help raise student achievement by assisting schools to implement comprehensive school reforms that are based on scientifically based research and effective practices.

A key feature of the program is that it provides incentives for schools to develop comprehensive reform programs based on scientifically based research and effective practices. As a part of the requirements of the CSR grant, schools must integrate the eleven components of reform. Schools are required to implement a comprehensive school reform program that:

- Employs proven methods and strategies based on scientifically based research
- Integrates a comprehensive design with aligned components
- Provides ongoing, high-quality professional development for teachers and staff
- Includes measurable goals and benchmarks for student achievement
- Is supported within the school by teachers, administrators and staff
- Provides support for teachers, administrators and staff
- Provides for meaningful parent and community involvement in planning, implementing and evaluating school improvement activities
- Uses high-quality external technical support and assistance from an external partner with experience and expertise in schoolwide reform and improvement
- Plans for the evaluation of strategies for the implementation of school reforms and for student results achieved, annually
- Identifies resources to support and sustain the school's comprehensive reform effort

- Has been found to significantly improve the academic achievement of students or demonstrates strong evidence that it will improve the academic achievement of students.

As stated above, one of the key components of the CSR grant is to provide ongoing, high-quality professional development for teachers and staff. Based on the research reform model selected, teachers are required to attend professional development on the selected reform.

The third grant identified is the High Schools That Work (HSTW) grant. High Schools That Work is a whole-school, research and assessment-based reform effort for grades nine through twelve established by the Southern Regional Education Board (SREB) in 1987. This initiative offers a framework of goals, key practices, and key conditions for accelerating student learning and raising standards. Its recommended actions give direction, as schools work to improve both academic and career education. According to "An Educators' Guide to School wide Reform" that was issued by the Washington-based American Institute for Research, HSTW is one of only three popular school reform models with strong evidence supporting its efficacy in improving student achievement. In February 2001, Missouri joined the HSTW consortium of states. Member schools implement 10 Key Practices for changing what is expected of students, what they are taught, and how they are taught.

SREB provides member states and sites with staff development, technical assistance, communications and publications, and assessment services. The HSTW Assessment provides data on student's reading, mathematics and science achievement as well as students' and teachers' opinions on high school curriculum and instruction. The

annual High Schools That Work Summer Staff Development Conference for some 6,500 educators is a focal point for year-round professional development. In addition, HSTW schools are required to have a technical assistance evaluation (TAV) on entering the program and a technical review evaluation (TRV) during the last year of participation.

High Schools That Work has grown from 28 pilot sites in 13 states to its current size of more than 1,200 sites in the following 32 states: Alabama, Arkansas, Delaware, Florida, Georgia, Hawaii, Idaho, Illinois, Indiana, Kansas, Kentucky, Louisiana, Maryland, Massachusetts, Mississippi, Missouri, Nebraska, New Jersey, New Mexico, New York, North Carolina, Ohio, Oklahoma, Pennsylvania, South Carolina, South Dakota, Tennessee, Texas, Vermont, Virginia, Washington and West Virginia.

The No Child Left Behind Act signed into law by President George W. Bush on January 8, 2002, established Reading First as a new, high-quality evidence-based program for the students of America. The Reading First initiative builds on the findings of years of scientific research, which were compiled by the National Reading Panel. This grant focuses on the elementary school and, more specifically, grades kindergarten through third grade (K-3).

Reading First is a focused nationwide effort to enable all students to become successful early readers. Funds are dedicated to help states and local school districts eliminate the reading deficit by establishing high-quality, comprehensive reading instruction in kindergarten through third grade. Building on a solid foundation of research, the program is designed to select, implement, and provide professional development for teachers using scientifically based reading programs, and to ensure accountability through ongoing, valid and reliable screening, diagnostic, and classroom-

based assessment (U.S. Department of Education, 2002). There are a number of criteria used to determine eligibility for the Reading First grant; however, the two most important areas are the percentage of students in the bottom two areas of the MAP tests and the census poverty percentages. Choices of buildings within the district are determined using free and reduced lunch percentages.

Summary

According to the literature review on staff development, many educators have opinions concerning staff development programs. Whether positive or negative, these opinions affect the attitudes of the educators when they attend professional development activities. Staff development activities once involved one-shot, drive-through workshops. However, in the last 10 years, staff development programs have become more directed toward the end product of helping students achieve. Veteran teachers often feel that professional development programs are a waste of time and that the methods currently being utilized in the classroom are effective. However, beginning teachers are often grasping for ideas to allow them to be effective classroom teachers. This literature quoted research that professional development is important for promoting student success. Yet, many educators are still skeptical. While some veteran teachers are often unaccepting of the changes that staff development programs often bring, the students of today are not the typical students from the past. The societal changes that have come to schools demand that a wide variety of instructional strategies geared toward individual differences of students be utilized in order to teach the curriculum to every student.

As new standards for student learning have been introduced across the nation, more attention has been given to the role that teacher quality plays in student achievement (National Commission on Teaching and America's Future, 1996, National Education Goals Panel, 1998). In the last few years, more than 25 states have enacted legislation to improve teacher recruitment, education, certification or professional development (Darling-Hammond, 1997a).

After four decades of federal, state, and local efforts aimed at improving student outcomes, it is difficult to recognize how any particular intervention influenced them. Even when professional development has been implemented on a broad scale in a state (Cody & Guskey, 1997) and there has been discernable improvement in student outcomes (Petrosko, 1997), it has not been possible to establish a causal connection. Without well-defined programs and systematic assessments, it has been nearly impossible to unravel the influence of professional development from the influence of many other policies, mandates, and practices. In order to transform professional development using new concepts, educators need a better understanding of past practices and processes. Historical insights will inform the rethinking of current and future professional development practices, with the goal of enabling educators to provide students with enriched learning.

The problem with trying to identify the critical elements of successful professional development programs is that most efforts focus on a search for "one right answer." Rarely is change in professional development considered, and rarer still is any assessment of impact on student learning (Guskey & Sparks, 1991).

CHAPTER 3

METHODOLOGY

Introduction

The passage of Goals 2000 by Congress, the Outstanding Schools Act (SB380) in Missouri and the No Child Left Behind Act (NCLB) of 2001 has given increased emphasis on teacher development and its role as an essential component of achieving student success and excellence. Therefore, there must be a clear vision of excellence in performance so that educators know how to work toward the standard.

As stated previously, the majority of earlier studies on professional development have focused on program outcomes for the success of students. This study will examine the impact of professional development on MAP scores and ACT scores in selected Missouri school buildings that have implemented at least one of the selected reform grants. This chapter outlines the procedures used for the study and describes the statistical treatment of the data obtained from the Missouri Department of Elementary and Secondary Education.

Preliminary Procedures

In order to obtain data, the preparation for this study will take the following preliminary steps:

1. Obtain information from Department of Elementary and Secondary Education (DESE) containing district performance data on state MAP and ACT standardized assessments.

2. Obtain a list of school buildings that have implemented one or more of the following grants: Comprehensive School Reform (CSR), High Schools That Work (HSTW), Reading First, or eMINTS.
3. Obtain a list of school buildings with similar per pupil expenditures, similar student enrollment size, and similar free and reduced lunch percentages that have not implemented at least one of the following grants: Comprehensive School Reform (CSR), High Schools That Work (HSTW), Reading First (MORF), or eMINTS.
4. Examine the Missouri Annual Performance Reports (APR) supporting data for the 2000-2001 to 2004-2005 school years.
5. Compare the districts' criteria obtained from APR (MAP scores, ACT, etc.)

Research Design

This research study is quantitative in nature. In addition, it uses an evaluation research approach to aid school districts in making professional decisions about the impact of professional development on student achievement. The Missouri Assessment Program (MAP) and the American College Test (ACT) data will be used for analysis. The MAP test is required in the areas of mathematics, communication arts, science, social studies, and reading. However, in 2003, because of the lack of state funding, the state reduced the mandated testing to the academic areas of mathematics, communication arts, and reading. The MAP test is aligned to specific grade levels as follows: Mathematics is administered in the fourth, eighth and tenth grades; Communications Arts is administered in the third, seventh, and eleventh grades; reading is administered only in the third and

seventh grades. Therefore, for the purpose of this study, only the required testing areas will be considered for the 2000-2001 school year through the 2004-2005 school year.

The MAP test data for mathematics and communication arts is divided into five levels which include advanced, proficient, nearly proficient, progressing, and step 1. An analysis will be made based on the mean MAP score as defined by DESE. The MAP test data for reading includes different levels such as proficient, satisfactory, and unsatisfactory. The mean MAP score will also be used for the reading portion; however, the percentage of students performing at the various levels will be examined.

The ACT data will be obtained from the Missouri Department of Elementary and Secondary Education's (DESE) website under the school statistics section. ACT data is based on the percentage of seniors scoring above the national average and the composite score achieved by each school district. Most of the data pertaining to the academic achievement of students will be collected from each building's test records on the DESE website (http://dese.mo.gov). The results of the test will be disaggregated by building configuration, similar student enrollment, and the percentage of students on free and reduced lunch. Due to the parameters surrounding this project, subjects are randomly selected based on size and characteristics of selected buildings.

Subjects

The sample for this study includes all of the Missouri school buildings that have implemented at least one or more of the four following grants: Comprehensive School Reform (CSR), High Schools That Work (HSTW), Reading First, and eMINTS. A comparable sample will be selected from school buildings that did not participate in at

least one of the four selected grants. The Reading First grant requires elementary school buildings to be eligible based on a pre-determined set of criterion. Therefore, the elementary buildings used to compare with the Reading First buildings will be selected from those schools that did not receive the grant or those that were eligible for the grant but did not submit an application.

The data in this study will be the mean scores of the MAP test or the ACT test for students who have participated in the educational process in these school buildings during the past five school years. The exact number of students involved in the research was actually the number of students included in the school records when the data was collected. This research involves collecting data on the selected areas of student performance from the selected elementary, middle, and high schools as reported on the DESE website.

Instrumentation

The instruments used in this study will be the Missouri Assessment Program (MAP) tests and the American College Tests (ACT). The data from the Department of Elementary and Secondary Education website will be collected for analysis.

When assessment tests are used for results, two important qualities, validity and reliability, must be considered. The first quality examined is how meaningful or "valid" the results are in relation to the intended purpose(s). The second characteristic is how dependable or "reliable" the results are. These two characteristics are closely connected; in fact, score dependability limits score meaningfulness. Assessment data can be evaluated by examining score dependability; however, score meaningfulness must be

considered to arrive at sound judgments about the worth of results (Schattgen, Reading First Application, Missouri, 2003).

The Missouri Assessment Program (MAP) is one of several educational outcomes that emerged from the Outstanding Schools Act of 1993 (Senate Bill 380). As a result of SB380, the State Board of Education directed the Missouri Department of Elementary and Secondary Education (DESE) to identify the knowledge, skills, and competencies that Missouri students should attain by completion of high school and to assess student progress toward these academic standards. DESE staff, along with other key individuals, worked to develop the Show Me Standards and to create the MAP as a tool for evaluating the proficiencies represented by the Standards. The MAP includes Mathematics assessments for grades 4, 8, and 10; Communication Arts assessments for grades 3, 7, and 11; Science assessments for grades 3, 7, and 10; and Social Studies assessments for grades 4, 8, and 11.

Information on reliability and validity was supplied by a staff member at the Missouri Department of Elementary and Secondary Education (M. Muenks, personal communication, September 21, 2007) and the same information is available on the web at the following address: dese.mo.gov/divimprove/fedprog/discretionarygrants/ReadingFirst/DMAP.pdf

According to Appendix D of the Reading First Application, written by Sharon Schattgen, DESE ensures the meaningfulness or validity of MAP scores as indices of proficiency relative to the Show-Me Standards by using methodical and rigorous test-development procedures. CTB McGraw and DESE have developed MAP assessments in accordance with accepted procedures and criteria (as articulated, for example, in

Standards for Educational and Psychological Testing, AERA, APA, NCME, 1985), intentionally aligning MAP assessments to the specific Show-Me Standards being measured at that grade and subject area.

Dependability or reliability is built into the test-construction process in the same manner as score meaningfulness. All educational test scores reflect some degree of error; no mental measurement is perfect and the error can come from a variety of sources: the instrument itself, the examiner, the assessment environment, the scoring process, and, in the case of assessments like the MAP, in the process of establishing cut-point scores for the various achievement levels.

Ample technical evidence supports the claim that MAP scores are valid and reliable measures of achievement relative to the Show-Me Standards. They are, in fact, more reliable than results from several other tests used for similar purposes (Missouri Department of Elementary and Secondary Education, 2001).

The American College Test (ACT) emerged in the 1950s. The organization itself was founded in 1959 when U.S. political and demographic developments were inspiring major changes in attitudes about, and approaches to, higher education.

In the late 1950s, large numbers of students were approaching college age and wanted to attend college. Financial aid to students was increasing, and most colleges desired increasing enrollments. It was in this environment that ACT's founders established The American College Testing Program, Inc., now known as ACT. ACT's first testing program, the ACT Assessment, was a college entrance exam used primarily by colleges in the Midwest and the South.

The ACT has four required sections--English, Math, Reading, and Science--and an optional Writing section. The ACT was designed to help students make better decisions about which colleges to attend and which programs to study, and to provide information helpful to colleges both in the process of admitting students and in ensuring their success after enrollment.

According to the Standards for Educational and Psychological Testing (AERA, APA, & NCME, 1999), "validity refers to the degree to which evidence and theory support the interpretations of test scores entailed by proposed uses of tests" (p. 9). Arguments for the validity of an intended inference made from a test may contain logical, empirical, and theoretical components. A distinct validity argument is needed for each intended use of a test.

The potential interpretations and uses of ACT scores are numerous and diverse and are justified by a validity argument in the ACT Technical Manual. Validity issues are discussed for five of the most common interpretations and uses: measuring college-bound students' educational achievement in particular subject areas, making college admissions decisions, making college course placement decisions, evaluating the effectiveness of high school college-preparatory programs, and evaluating students' probable success in the first year of college and beyond (ACT Technical Manual, 2007).

School districts receive an annual report card from DESE, called the Annual Performance Report (APR), which entails a number of performance standards. School districts must have a classification of "MET" on a specified number of the standards in order to obtain accreditation. Seven of the standards used in determining accreditation are the various grade level MAP tests and the ACT which become the measuring tool for

district performance. Therefore, since these assessment items are used by DESE in determining school district accreditation, the reliability and validity of the measuring instruments are moot. However, a brief explanation of validity and reliability of the tests is beneficial when considering the instruments used for analysis.

Data Collection

Data for this project will be collected from all of the Missouri school buildings that have implemented at least one of the four grants (Comprehensive School Reform (CSR), High Schools That Work (HSTW), Reading First (MORF) or eMINTS) and buildings that have received none of the grants. The reason for selection of these four grants is that each grant requires a sustained professional development program. In addition, the grants also have a specified number of years of funding in order to establish a sustained program. The eMINTS grant is a two-year grant with continued implementation following the initial two-year phase. The CSR grant and the MORF grant are three year grants, while the HSTW grant is a five-year grant. Of all the grants, the MORF grant has the most stringent guidelines for eligibility. To be eligible for the Reading First grant, a number of criterion are used; however, the two most important areas are the percentage of students in the bottom two areas of the MAP test and the census poverty percentages.

The timelines surrounding the grants vary but generally require submission of an application in the spring of the previous year with professional development activities starting during the summer. It continues with implementation of the grant starting at the beginning of the upcoming school year and full fruition by the spring of the first school

year. The professional development program mandated by these grants implements a pre-approved list of successful reform models as designated by the requirements of the grant.

In addition, it is necessary to know that only high schools are eligible for the HSTW grant. All school buildings are eligible for participation in the CSR grant, but, for the purpose of this study, only CSR grants awarded in the middle schools will be examined. Finally, only elementary schools are eligible for the Reading First and the eMINTS grants.

For the purpose of data comparison, the remaining school buildings will be selected from those school buildings or districts that have similar peer characteristics and did not participate in at least one of the designated grants. The MAP and ACT achievement data will be collected for each of the buildings selected in the study. The data collected for the MAP test will be the mean MAP score, while the data collected for the ACT test will be the composite score. In addition, the mean average of MAP scores will be examined for comparison. These mean scores will then be compared using the 2000 school year as a base year and continuing through the 2005 school year. For the purpose of examining the ACT, the composite score will be used to determine student achievement.

This study hypothesizes that sustained professional development does not have an impact on higher student achievement on the Missouri Assessment Program and the American College Test.

Data Analyses

Because research has shown a link between professional development and student achievement, it is necessary to do an analysis on building MAP and ACT data. Tabulation of the data will be completed to analyze the impact of professional development to district performance data. In order to analyze the data, the researcher will use a two factor Analysis of Variance (ANOVA) with repeated measures on the second factor. The first factor is Funded Activity Participation (participation vs. no participation) with the repeated measure being the year (2001, 2002, 2003, and 2004). This two-factor ANOVA will be analyzed independently on the HSTW and CSR grants based on participation or no participation.

For the purpose of examining the elementary building grants, the researcher will use a two-factor Analysis of Variance (ANOVA) with repeated measures on the second factor. The first factor is Funded Activity Participation (participation in both grants, participation in one grant, and no participation) with the repeated measure being the year (2001, 2002, 2003, and 2004). The data will be reported in a number of methods including raw data, percentages, and standardized scores. The data will be displayed in tables, graphs, and charts, and will include narrative text.

Summary

The intention of this study is to determine if sustained professional development has a significant impact on the performance of students. Through the collection of archival data, comparisons will be made to determine the effects of the selected school reform grants on the performance of the students in the various selected Missouri school

buildings. Data for this research will be collected for a five-year period, the 2000-2001 through 2004-2005 school years. This chapter has explained the methods to be used in this quantitative study that will attempt to use student performance assessments to determine the impact of sustained professional development on student achievement. The next chapter will present the results obtained from these methods.

CHAPTER 4

DATA ANALYSIS AND RESULTS

Throughout the past decades, there have been continual concerns about the educational environment and teacher impact on student achievement. As a result, numerous reform movements were enacted in order to improve education and provide quality professional development opportunities to enhance student performance. These reform grants were geared toward furnishing professional development opportunities for teachers to prepare students for more rigorous state and federal mandates.

For the purpose of this research, the grants examined included Reading First (MORF), “enhancing Missouri's Instructional Networked Teaching Strategies” (eMINTS), Comprehensive School Improvement (CSR), and High Schools That Work (HSTW). Each of these grants has various components that required a sustained effort of professional development.

As stated in Chapter 1, the purpose of this study was to determine the impact of systematic professional development on selected areas of student performance in selected Missouri school buildings. Three major research questions were examined to help guide the study. The questions were as follows:

1. What are the perceptions of the stakeholders on current staff development programs in schools?
2. What types of professional development activities appear to have the greatest impact on student achievement?

3. When implementing professional development programs, how do building enrollment size, building free and reduced lunch percentage, and district per pupil expenditure affect student achievement?

These questions were investigated by using the communication arts, reading, and mathematics MAP tests, and the ACT test.

An Analysis of Variance (ANOVA) was used to determine any significant differences between school buildings that implemented the selected grants and those that did not implement these grants. To facilitate this study, performance data was collected from the Missouri Assessment Program (MAP) in the areas of Communication Arts in the third, seventh, and eleventh grade levels and Mathematics in the fourth, eighth, and tenth grade levels. In addition, third and seventh grade Reading Proficiency and the ACT composite scores were examined. As stated previously, the selected schools implemented one or more of these grants. For data comparison, the remaining school buildings were selected from school buildings or districts with similar characteristics that did not participate in at least one of the designated grants. The results of analyses proposed in Chapter 3 are summarized in this chapter. Each of the hypotheses is listed, followed by the descriptive statistics tables, related figures, and a statement of the results for hypotheses tests. An alpha level of 0.05 was used for all statistical tests and SPSS, Version 15, for all analyses.

Statement of Hypothesis and Results of Analysis

Hypothesis 1: There will be no significant difference in student achievement in school buildings that implement funded systematic professional development programs for educators in the areas of mathematics, communication arts, third and seventh grade reading, and ACT scores than in those that have one or no funded projects.

For Hypothesis 1, the null hypothesis was rejected. Based on the study, there were a number of significant differences in connection with student achievement. Data analyses performed on the MAP Test scores showed significant differences between schools that implemented one or more of these reform grants and schools that did not implement these grants. School buildings that implemented grants with systematic professional development programs had significant gains in the mean MAP scores in only certain grade levels.

When considering the professional development implemented in the four reform grants, not all appeared to have significant impact on student achievement. As depicted in the tables and graphs shown in the Third Grade Report and Fourth Grade Report below, data analysis seemed to indicate that Reading First had the greatest impact on student achievement. More precisely, Reading First showed significant gains in the third grade Communication Arts and Reading Proficiency portions of the MAP test after 2 years of participating in the grant. In addition, schools utilizing the Reading First program experienced improvements in MAP scores in the categories of enrollment, free and reduced percentage, and per pupil expenditure. On the contrary, schools that participated in eMINTS for 2 years did not show significant gains in student achievement in the third and fourth grade MAP tests. The Comprehensive Reform (CSR) grant administered in the

seventh and eighth grade was not significant in relation to improved student achievement. Like the CSR grant, High Schools That Work (HSTW) data did not indicate any significant gains in student achievement throughout the 5 years of the study.

Hypothesis 2: There will be no significant difference in student achievement in buildings that implement multiple funded projects or grants that require sustained professional development than in those that have one or no funded projects.

For Hypothesis 2, the null hypothesis was rejected. Results of this hypothesis only applied to the third grade Communication Arts and Reading Proficiency areas of the MAP test. Of the grades examined in this study, only third grade implemented multiple grants. The two grants administered in the third grade were Reading First and eMINTS. The study revealed significant differences in a number of areas regarding student achievement. Data analyses performed on the MAP scores indicated significant differences between schools that implemented multiple reform grants and schools that had one or no funded projects. As depicted in the tables and graphs in the Third Grade Report below, student gains were evident in schools that participated in both Reading First and eMINTS for one year. However, data also revealed that when schools had participated in Reading First and eMINTS for two or more years, MAP scores declined.

This research project examined data from school buildings in all 524 school districts in Missouri to determine the impact of grants that required sustained professional development. In addition, schools with similar enrollment size, free and reduced lunch percentage (F/R) and per pupil expenditure (PPE) were analyzed. The mean was calculated for each category and standard deviations were used to distribute an equitable number of school buildings in each comparative group.

The first category examined was enrollment. Schools were ranked by the enrollment size and the median enrollment was 630.5. From the median (= 630.5), schools that had an enrollment greater than one positive standard error (= 163.22) were marked as High and those below one standard error from the median were marked as Low. The school buildings between the two calculations were excluded to get two distinct groups of schools.

Group	Category	Descriptor
1	H	Greater than or equal to 796
2	L	Less than or equal to 464

The following chart clarifies the enrollment distribution groups and number of buildings in each category.

Enrollment	Grade						
	3	4	7	8	10	11	District
High = 1	821	817	354	350	296	292	262
Low = 2	212	213	213	213	144	144	143
Eliminated	99	99	97	97	93	95	92

Free and reduced lunch percentage (F/R) was the second category examined to compare school buildings. The schools were ranked by the percentage of students who qualified for free and reduced meals through the National School Lunch Program (NSLP). A High and Low F/R percentage category was determined for each grade level. The number of school buildings in each category was determined by taking the standard deviation above and below the mean of each grade level. The chart below illustrates the mean percentage and standard deviation for each grade level. The school buildings between the two calculations were excluded to achieve two distinct groups of schools. For the ACT analysis, the data was based on the district F/R percentage instead of the

building percentage. In addition, the chart provides the breakdown for determining High and Low F/R categories.

Grade	F/R Mean	F/R Std Dev	F/R Std Error	High	Low
3	50.90	24.47	0.32	>= 51.22	<= 50.57
4	51.05	24.56	0.33	>= 51.38	<= 50.72
7	47.57	21.75	0.38	>= 47.94	<= 47.19
8	47.29	21.64	0.37	>= 47.67	<= 46.92
10	38.78	19.90	0.38	>= 39.17	<= 38.39
11	38.47	19.65	0.38	>= 38.85	<= 38.09
District (ACT)	36.88	17.34	0.35	>= 37.22	<= 36.53
*Schools with percentages between High and Low were eliminated *Districts between High and Low were eliminated					

As stated above, school buildings were divided into High and Low categories and a number of school buildings were excluded to obtain two distinct groups. The chart below shows the number of school buildings in each category and the number of schools eliminated.

Free and Reduced	Grade						
	3	4	7	8	10	11	District
High = 1	554	552	303	296	237	233	225
Low = 2	566	568	354	344	291	291	263
Eliminated	12	9	7	20	5	7	9

The final category examined was per pupil expenditure (PPE). Data gathered from the Department of Elementary and Secondary Education website provided the per pupil expenditure for each district. However, the data available on the DESE website required using district per pupil expenditure rather than building per pupil expenditure. The process of examining the PPE did not include the St. Louis Special District in the mean calculation because its PPE of $106,000 was substantially more than the other districts in

the state. The PPE of the Special School District would have grossly distorted the data. PPE was divided into three distinct groups which were classified as High, Medium, and Low PPE groups. To obtain the categories High, Medium and Low, a 0.4 standard deviation above the mean was used and a 0.6 standard deviation below the mean was used because the distribution was skewed to the left. The objective was to obtain an equal number of schools in the High, Medium and Low categories. Also, a band of schools in the +/- 0.25 standard error from the deviations of the mean were excluded to obtain three groups as distinct as possible from each other. The following chart clarifies the PPE distribution groups and number of buildings in each category.

Group	Category	Descriptor
1	High	Greater than or equal to $7,164.90
2	Medium	Between $5,911.70 and $7,055.40
3	Low	Less than or equal to $5,802.30

The distribution group for PPE resulted in 111 High PPE schools (H = 111), 229 Medium PPE schools (M = 229), and 134 Low PPE schools (L = 134), while 48 school buildings were excluded from the analysis.

The remainder of Chapter 4 pertains to the selected grants and student performance in the selected areas of the MAP test and ACT test at respective grade levels. In addition, the impact of enrollment, free and reduced lunch percentage and per pupil expenditure was considered when examining performance. The data analysis is arranged in the order of the reform grants, grade level order, and followed by the descriptive statistics tables, and related figures. The order of the reform grants is eMINTS and Reading First, CSR, and HSTW.

eMINTS AND READING FIRST GRANTS

The eMINTS and Reading First Grants (MORF) were implemented in the elementary school; hence, third grade Communication Arts, third grade Reading Proficiency, and fourth grade Mathematics were used for data comparison.

The dependent variable for the Third and Fourth Grade Report sections was mean MAP score, which was considered through the three independent variables of enrollment, free and reduced lunch percentage (F/R), and per pupil expenditure (PPE).

Third Grade Report

It is beneficial to know that eMINTS was implemented in the third grade and the Reading First (MORF) grant was implemented in Kindergarten through the Third (K-3) grade. For the purpose of this research, Communication Arts and Reading Proficiency were the only MAP areas analyzed in the third grade.

In the process of analyzing eMINTS, the reader should know that eMINTS 0 = Non eMINTS, eMINTS 1 = 1 year in eMINTS, and eMINTS 2 = 2 or more years in eMINTS. These categories encompass the same schools in each of the 5 years of this study. For the purpose of understanding Reading First figures, RF 0 = Non Reading First, RF 1 = 1 year in RF (either 2004 or 2005), and RF 2 = 2 years in RF (2004 and 2005). Note that a school remained in this category for the entire period of this study. Likewise, if a school was RF 0 it was not in Reading First in any of the 5 years of this study. If a school was RF 1 it participated in Reading First in either year 4 or 5. Throughout the report, if a school was RF 2, it participated in Reading First in year 4 and year 5.

The dependent variable for the Third Grade Report section was mean MAP score which was considered through the three independent variables of Enrollment, F/R Lunch, and PPE. Schools that had an enrollment greater than 796 were classified as High Enrollment schools and those that had an enrollment less than 494 were classified as Low Enrollment schools. The distribution for enrollment was 812 High Enrollment schools (High = 812), 212 Low Enrollment schools (Low = 212), while 99 school buildings were excluded from the study. The free and reduced variable had a mean average of 50.90 with a standard deviation of 24.47. Schools with a F/R percentage less than 50.22 were classified as Low F/R and schools with a F/R percentage greater than 50.57 were classified as High F/R. Based on the distribution of F/R schools, there were 554 schools identified as High free and reduced (High F/R = 554), 566 identified as Low free and reduced (Low F/R = 566), and 12 schools excluded from the category. In the area of PPE, schools with expenditures greater than or equal to $7,164.90 were categorized as High PPE schools, schools with expenditures between $5,911.70 and $7,055.40 were categorized as Medium PPE, and schools with expenditures less than or equal to $5,802.30 were categorized as Low PPE schools. The distribution group for PPE resulted in 111 High PPE schools (H = 111), 229 Medium PPE schools (M = 229), and 134 Low PPE schools (L = 134), while 48 school buildings were excluded from the analysis.

Dependent Variable: Mean MAP Score/School Category: Enrollment

Table 1.1

Means and Standard Deviations of Mean Third Grade Communication Arts MAP Scores of Schools in eMINTS and Reading First Programs for Different Enrollment Categories

Enroll	eMINTS Category	RF Category	2001		2002		2003		2004		2005	
			Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
High	Non eMINTS	Non RF	639.7	12.9	643.3	13.0	642.1	13.0	642.8	12.5	643.5	12.9
		RF 1	620.8	17.8	624.8	14.3	617.6	17.7	619.6	12.6	629.2	16.2
		RF 2	624.0	12.1	624.2	12.0	618.8	14.7	624.4	15.8	628.3	16.5
	eMINTS 1 yr	Non RF	635.1	8.7	641.9	9.6	641.5	8.1	639.6	8.6	638.5	8.9
		RF 1	627.2		626.9		629.3		619.7		621.3	
		RF 2	622.0		623.1		624.9		626.6		622.3	
	eMINTS 2+ yrs	Non RF	639.5	9.0	643.0	10.5	640.9	9.6	641.2	9.2	642.2	10.5
		RF 1	634.6	7.4	638.3	1.4	632.6	10.0	635.8	4.7	631.1	6.2
		RF 2	636.6	2.8	638.3	10.8	637.5	3.6	635.0	3.1	633.2	5.3
Low	Non eMINTS	Non RF	639.7	12.5	642.2	14.8	640.8	13.3	641.1	12.3	641.0	12.8
		RF 1	636.8	5.3	631.4	9.5	636.7	11.6	636.4	9.0	636.3	8.9
		RF 2	630.8	10.8	637.0	16.8	636.9	14.9	640.5	13.8	646.1	11.8
	eMINTS 1 yr	Non RF	641.7	10.5	653.2	12.1	635.5	12.2	640.8	13.7	636.3	4.8
		RF 2	635.5		627.6		646.8		660.4		673.5	
	eMINTS 2+ yrs	Non RF	638.7	10.0	642.7	15.2	641.6	11.0	644.8	11.8	640.2	12.7
		RF 1	640.0		635.8		632.5		620.4		636.8	
		RF 2	635.4	13.8	635.5	11.1	636.7	11.0	638.5	6.0	634.1	18.1

Table 1.2

Results for the Test of Significance of Within and Between-Subjects When Schools are Categorized by Enrollment Levels

Source	Sum of Squares	Df	Mean Square	F	Sig.
Tests of Between-Subjects Effects					
Intercept	81160212.8	1	81160212.8	158747.17	0.00
RF_Category	5309.9	2	2655.0	5.19	0.01
eMINTS_Category	915.6	2	457.8	0.90	0.41
Enroll	2723.8	1	2723.8	5.33	0.02
RF_Category * eMINTS_Category	1744.0	4	436.0	0.85	0.49
RF_Category * Enroll	2864.3	2	1432.1	2.80	0.06
eMINTS_Category * Enroll	2507.4	2	1253.7	2.45	0.09
RF_Category * eMINTS_Category * Enroll	3835.8	3	1278.6	2.50	0.06
Error	483646.8	946	511.3		
Tests of Within-Subjects Effects					
Year	246.5	4	61.6	0.87	0.48
Year * RF_Category	1537.5	8	192.2	2.70	0.01
Year * eMINTS_Category	593.7	8	74.2	1.04	0.40
Year * Enroll	255.3	4	63.8	0.90	0.46
Year * RF_Category * eMINTS_Category	1988.3	16	124.3	1.75	0.03
Year * RF_Category * Enroll	1526.4	8	190.8	2.68	0.01
Year * eMINTS_Category * Enroll	501.6	8	62.7	0.88	0.53
Year * RF_Category * eMINTS_Category * Enroll	1350.8	12	112.6	1.58	0.09
Error (Year)	269033.9	3784	71.1		

Note: "Year" represents the Mean MAP score each year

As presented in Table 1.2, the results of the univariate analyses of variance (ANOVA) of the means obtained on the third grade Communication Arts MAP scores indicated the interactions **Year * RF_Category * eMINTS_Category** and **Year * RF_Category * Enrollment** were significant. The following figures depict the graphs of the interactions.

Graphs for the Year*eMINTS*RF interaction:

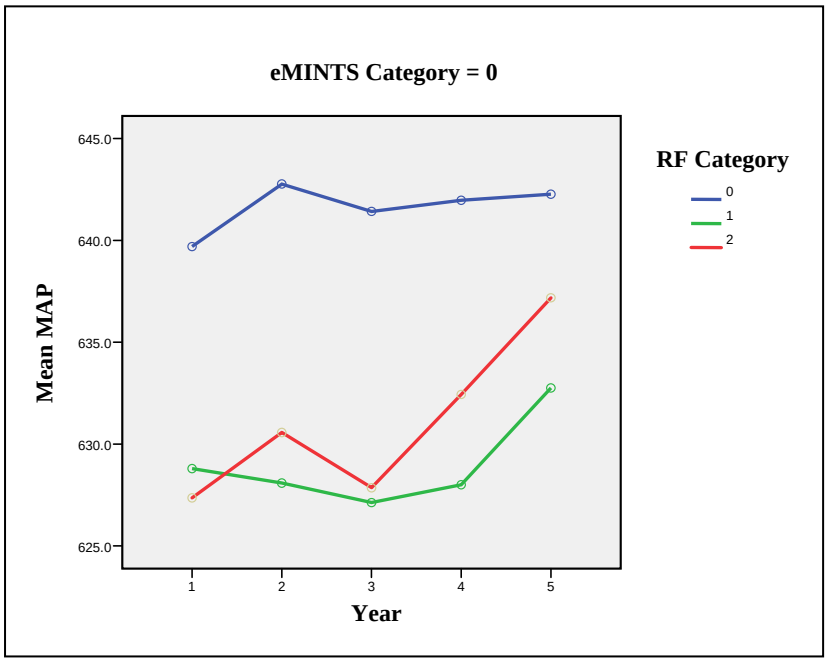

Figure 1.1.1. Year * Non eMINTS * RF Category

Figure 1.1.1 illustrates the interaction between non eMINTS (eMINTS = 0) and Reading First categories. The graph shows an interaction because the performance profile of RF 1 schools was different from the profiles of RF 0 and RF 2 schools. In all 5 years RF 0 schools performed substantially better than RF 1 and RF 2 schools.

In year 2, the performance of both non Reading First (RF 0) schools and RF 2 schools improved over year 1 scores and then declined in year 3. The performance of the RF 1 schools, on the other hand, dropped in the first 3 years.

After entering the Reading First program, the performance of both RF 1 and RF 2 schools improved considerably over the next 2 years. By year 5, RF 1 schools were performing 5 mean MAP points higher and RF 2 schools were performing 10 points higher than year 1. Nevertheless, even with increased scores, their performance remained

below the RF 0 schools. Schools that were not in either program performed better throughout the study.

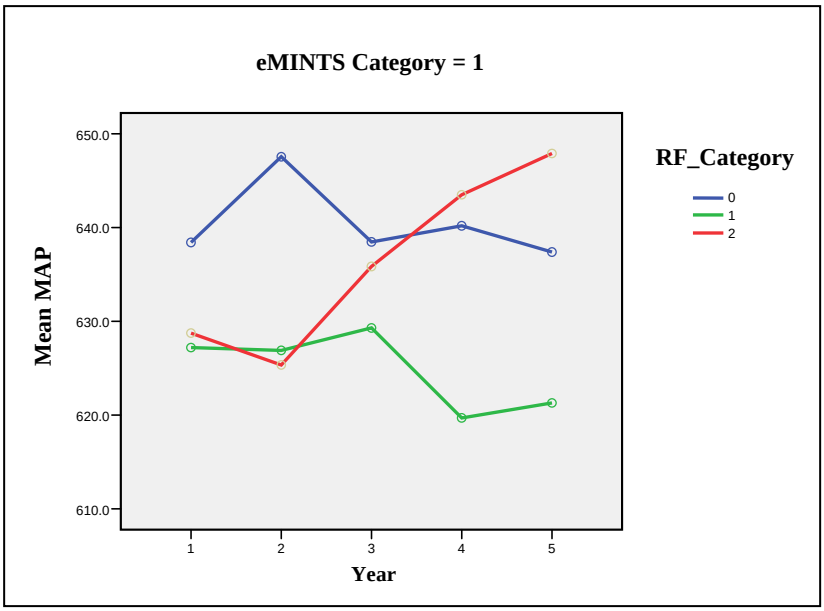

Figure 1.1.2. Year * eMINTS = 1 * RF Category

Figure 1.1.2 pertains to schools that had been in eMINTS for only 1 year (eMINTS = 1) during the period of this study. This graph displays the statistical significance pertaining to the variance of performance profiles for the different RF categories. In year 1, RF 0 schools performed nearly 10 points better than the other two RF categories. In year 2, there was an improvement in performance of the RF 0 schools, while the RF 1 and RF 2 schools showed no improvement.

In the subsequent years, the three RF category schools performed substantially different. The performance of RF 0 schools dropped below their original year 1 level. The RF 2 schools experienced significant improvements in their performance in years 3, 4 and

5. By year 5, they performed nearly 20 points higher than their year 1 score and the other RF categories.

The performance of RF 1 schools improved in year 3, however, the mean MAP score decreased by nearly 10 points. By year 5, RF 1 schools did not perform as well as the other RF categories.

Overall, RF 2 schools had the most success from being in the Reading First program. As can be seen from the graph, RF 2 mean MAP score was 648 at the end of the 5-year period, while the RF 0 and RF 1 ended with a mean MAP score of 638 and 621, respectively.

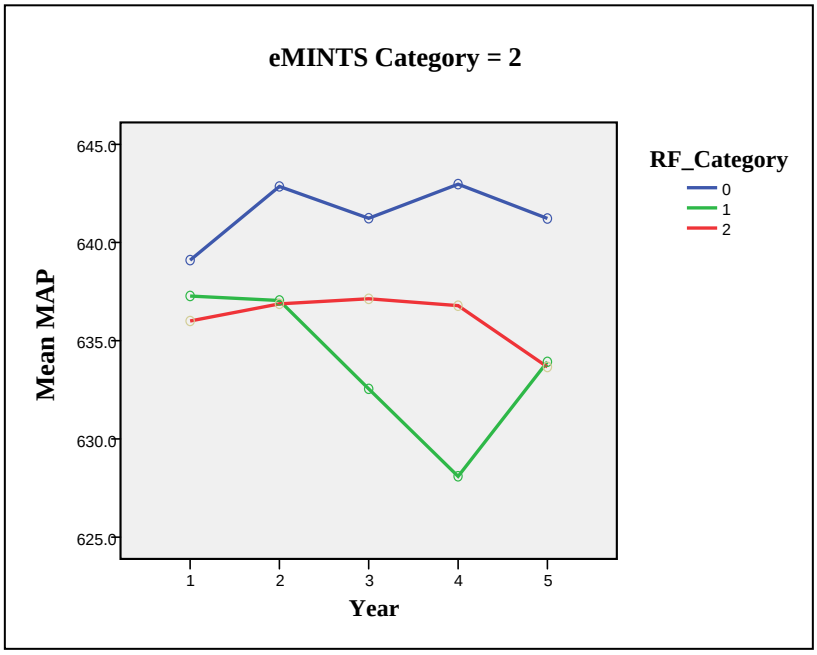

Figure 1.1.3. Year * eMINTS = 2 * RF Category

Figure 1.1.3 indicates schools that had been in eMINTS for 2 or more years (eMINTS = 2) during the period of this study. Like the non eMINTS (eMINTS = 0)

Category, RF 0 schools performed better than schools that participated in the Reading First grant and over the 5 years the performance did not significantly change.

Among schools that were eMINTS = 2, the performance of RF 1 schools declined consistently until they entered Reading First where the scores sharply increased for year 5. However, these schools still did not perform as well as the non RF schools in year 5.

The performance of eMINTS =2 schools and in Reading First in both years 4 and 5 improved marginally in the first 3 years and dropped after entering Reading First. In year 5, these schools performed below their year 1 scores.

Graphs for the Year*RF*Enrollment interaction:

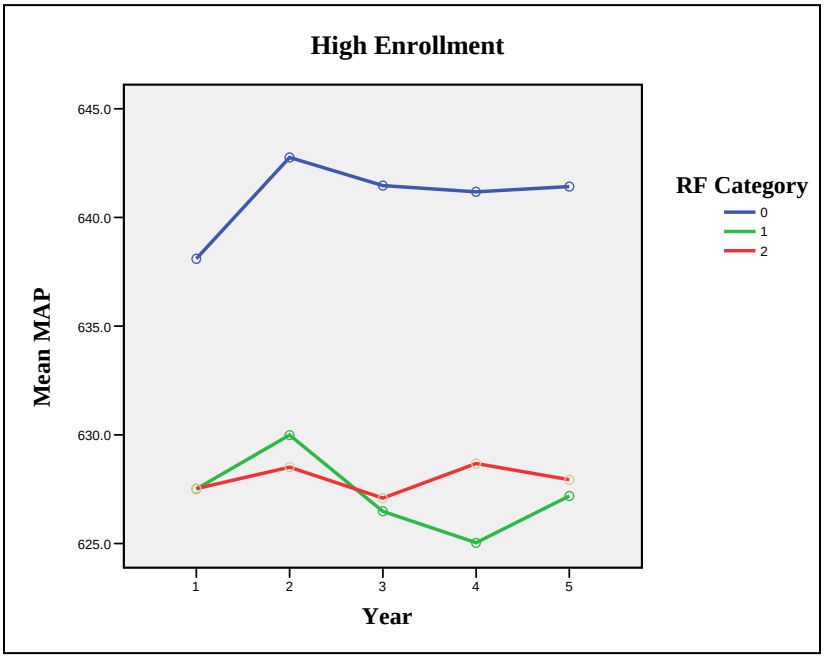

Figure 1.2.1. Year * High Enrollment * RF Category

The graph above depicts High Enrollment schools in relation to the various RF categories. Based on Figure 1.2.1, there was a significant interaction because the performance profiles for the Reading First categories were different.

Schools that were not a part of Reading First (RF 0) performed substantially better than the other RF category schools throughout the 5-year period. Except for a slightly larger gain in year 2, these schools performed the same level in all 5 years.

RF 1 schools performed slightly better in year 2, but their performance declined over the next 2 years. However, after entering the Reading First program in year 4, their performance improved.

RF 1 and RF 2 schools performed the same throughout the 5-year period. Overall, RF 1 and RF 2 schools performed below the RF 0 schools. By the end of year 5, there was no improvement in their performance compared to year 1. The mean MAP score for RF 0 schools was 642 compared to the mean MAP scores of RF 1 and RF2 which were 627 and 628, respectively.

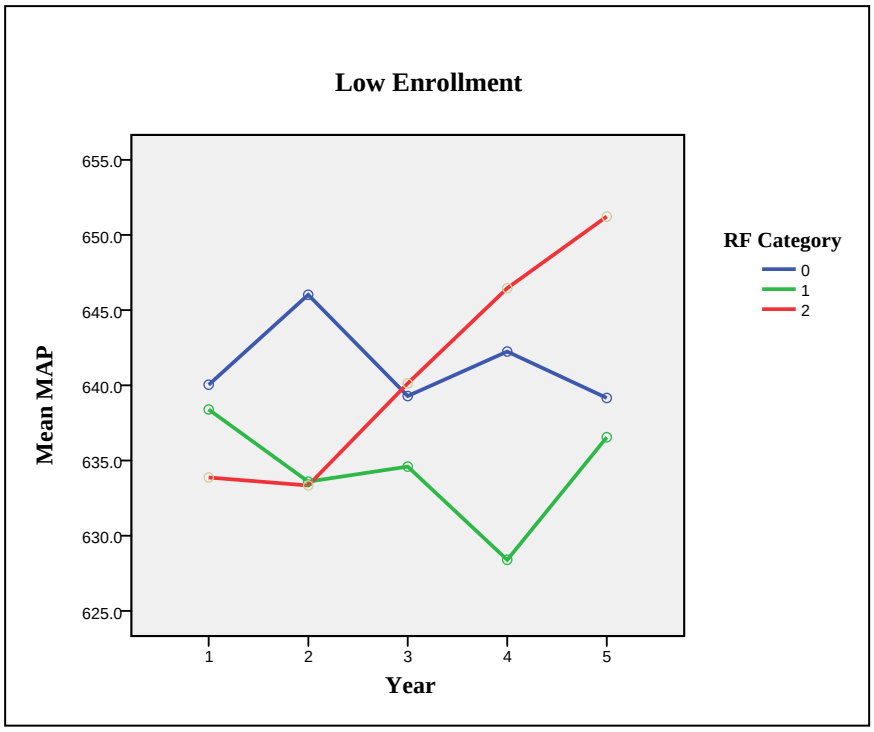

Figure 1.2.2. Year * Low Enrollment * RF Category

Low Enrollment schools are represented in Figure 1.2.2. Schools that were RF 0 performed slightly better than the other two RF categories. Throughout the 5 years, there was a relatively large improvement followed by a decline in the performance levels in year 2 and 3. Throughout the 5-year study, RF 0 performance remained the same.

The performance of RF 1 schools dropped from year 1 to year 4, but after entering the Reading First program they made substantial gains in their performance. However, RF 1 schools still did not reach their year 1 mean MAP score of 638.

Low Enrollment RF 2 schools declined in year 2 but gained nearly 20 points by the end of year 5. In addition, by the end of year 5, Low Enrollment RF 2 schools performed substantially better than the other RF categories. The RF 2 schools experienced substantial improvements from entering the Reading First program.

Dependent Variable: Mean MAP Score/School Category: Free and Reduced Lunch Percentage

Table 2.1

Means and Standard Deviations of Mean MAP Scores of Schools in eMINTS and Reading First Programs for Different Percent Free and Reduced Categories

% Free & Reduced	eMINTS Category	RF Category	2001		2002		2003		2004		2005	
			Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
High	Non eMINTS	Non RF	633.2	13.20	635.9	14.32	635.5	14.12	637.4	13.63	638.3	14.08
		RF 1yr	622.2	16.51	624.3	12.14	619.5	17.51	622.9	14.96	630.0	14.89
		RF 2yrs	626.5	11.97	628.4	14.86	626.6	17.36	631.0	15.75	635.5	17.01
	eMINTS 1 yr	Non RF	633.1	10.16	641.6	12.71	638.7	9.81	641.0	9.87	636.1	9.98
		RF 1yr	627.2		626.9		629.3		619.7		621.3	
		RF 2yrs	628.8	9.55	625.4	3.18	635.9	15.49	643.5	23.90	647.9	36.20
	eMINTS 2+ yrs	Non RF	636.6	10.94	640.4	11.45	638.9	10.83	639.9	9.49	639.3	10.12
		RF 1yr	632.2	11.18	635.2	4.60	632.3	6.66	630.7	8.68	634.6	7.10
		RF 2yrs	636.2	10.93	634.6	10.19	636.4	8.52	637.0	5.86	634.5	15.54
Low	Non eMINTS	Non RF	644.6	9.49	648.4	9.03	646.3	9.48	646.0	9.84	646.5	10.08
		RF 1yr	639.8	13.65	636.5	14.36	640.4	16.11	632.5	7.71	635.7	15.23
		RF 2yrs	636.3	8.71	645.3	12.96	641.6	14.94	639.1	21.76	645.5	9.52
	eMINTS 1 yr	Non RF	641.3	6.40	644.7	7.81	642.4	6.53	638.3	8.81	641.9	4.91
	eMINTS 2+ yrs	Non RF	642.7	7.39	645.8	10.71	643.1	9.66	644.4	8.97	645.7	10.09
		RF 1yr	629.3		637.3		639.7		639.1		635.4	
		RF 2yrs	636.7	3.54	643.8	6.01	639.7	5.72	637.4	3.11	637.7	2.24

Table 2.2

Results for the Test of Significance of Within and Between-Subjects When Schools are Categorized by Percent Free and Reduced Levels

Source	Sum of Squares	df	Mean Square	F	Sig.
Tests of Between-Subjects Effects					
Intercept	93778367.89	1	93778367.89	236443.14	0.00
RF_Category	4818.34	2	2409.17	6.07	0.00
eMINTS_Category	451.66	2	225.83	0.57	0.57
F/R	4369.98	1	4369.98	11.02	0.00
RF_Category * eMINTS_Category	400.08	4	100.02	0.25	0.91
RF_Category * F/R	2.74	2	1.37	0.00	1.00
eMINTS_Category * F/R	2032.05	2	1016.03	2.56	0.08
RF_Category * eMINTS_Category * F/R	197.30	2	98.65	0.25	0.78
Error	408123.24	1029	396.62		
Tests of Within-Subjects Effects					
Year	370.27	4	92.57	1.33	0.26
Year * RF_Category	600.31	8	75.04	1.07	0.38
Year * eMINTS_Category	294.06	8	36.76	0.53	0.84
Year * F/R	280.68	4	70.17	1.01	0.40
Year * RF_Category * eMINTS_Category	1162.79	16	72.67	1.04	0.41
Year * RF_Category * F/R	470.20	8	58.77	0.84	0.57
Year * eMINTS_Category * F/R	534.01	8	66.75	0.96	0.47
Year * RF_Category * eMINTS_Category * F/R	142.41	8	17.80	0.25	0.98
Error(Year)	287335.29	4116	69.81		

Note: "Year" represents the Mean MAP Score each year

As evident from Table 2.2, none of the within-subjects effects were significant. Only the **F/R** in the between-subjects effects was significant. The significance in F/R meant that there were differences in performance between High free and reduced (F/R), and Low free and reduced schools.

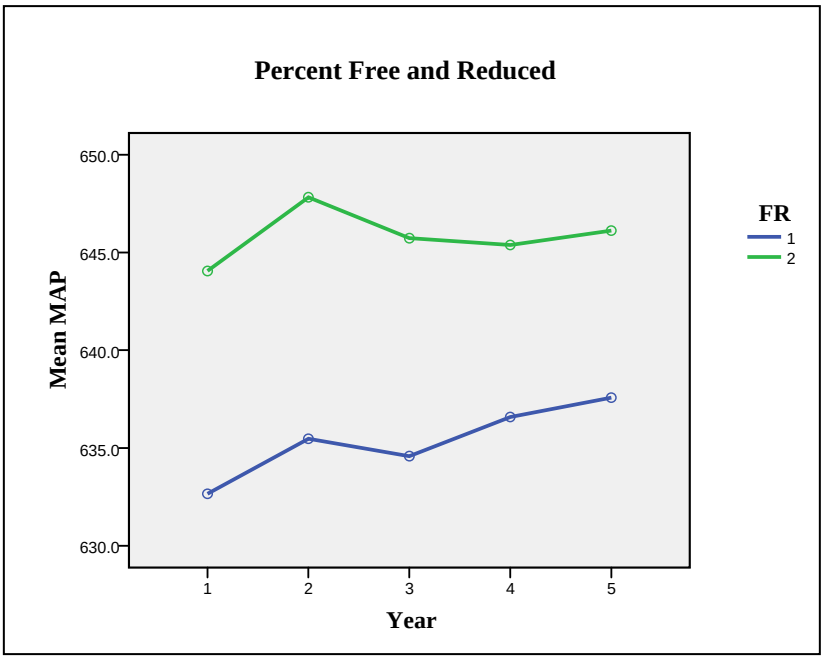

Figure 2.1.1. Year * Mean MAP * F/R Category

Figure 2.1.1 above shows that in all the 5 years, the mean MAP score of Low F/R schools were considerably better than High F/R schools. Schools classified as Low F/R had a mean MAP score of 644 while the schools with a larger number of students which qualified for free and reduced meals performed nearly 12 points lower with a mean MAP score of 632.

Dependent Variable: Mean MAP Score/School Category: Per Pupil Expenditure

Table 3.1

Means and Standard Deviations of Mean MAP Scores of Schools in eMINTS and Reading First Programs for Different Per Pupil Expenditure Categories

PPE	eMINTS Category	RF Category	2001		2002		2003		2004		2005	
			Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
High	Non eMINTS	Non RF	636.6	15.2	641.1	16.8	639.8	16.3	641.8	14.4	642.4	15.8
		RF 1yr	619.9	16.2	623.1	12.7	614.9	14.2	618.1	9.9	627.6	14.8
		RF 2yrs	624.1	12.3	623.5	13.5	620.7	16.5	628.3	18.1	630.4	18.3
	eMINTS 1yr	Non RF	627.9	4.9	644.6	9.4	637.6	10.4	630.0	13.2	630.8	5.9
	eMINTS 2+yrs	Non RF	635.0	15.5	640.3	13.7	636.7	15.9	642.0	12.6	644.2	12.1
		RF 1yr	640.0		635.8		632.5		620.4		636.8	
		RF 2yrs	646.0	14.6	637.8	11.9	636.4	4.9	636.6	1.9	628.7	18.9
Medium	Non eMINTS	Non RF	641.4	11.4	644.6	11.3	642.8	11.4	643.1	11.9	643.5	11.6
		RF 1yr	642.9	11.4	635.7	13.5	644.9	15.2	637.4	8.8	641.0	12.4
		RF 2yrs	632.0	10.8	639.1	14.3	637.0	15.6	636.7	14.0	644.3	10.9
	eMINTS 1yr	Non RF	642.7	8.5	642.8	10.3	638.8	8.0	638.7	6.8	639.0	7.8
		RF 2yrs	635.5		627.6		646.8		660.4		673.5	
	eMINTS 2+ yrs	Non RF	640.7	7.7	645.2	11.9	642.0	8.4	642.8	9.2	643.5	10.0
		RF 1yr	626.1	8.8	634.3	4.9	637.0	6.2	636.3	6.8	636.8	5.9
		RF 2yrs	633.7	7.4	635.6	10.2	637.1	8.6	637.1	5.9	636.4	13.1
Low	Non eMINTS	Non RF	641.0	8.7	643.2	9.6	642.4	8.7	642.0	9.1	643.2	8.5
		RF 1yr	616.2		627.5		648.9		660.4		647.1	
		RF 2yrs	631.2	5.4	632.3	6.8	636.8	2.9	634.6	4.7	642.4	7.0
	eMINTS 1yr	Non RF	633.2	8.6	641.9	13.5	642.8	9.3	645.4	7.0	640.2	9.8
		RF 1yr	627.2		626.9		629.3		619.7		621.3	
		RF 2yrs	622.0		623.1		624.9		626.6		622.3	
	eMINTS 2+yrs	Non RF	638.8	8.4	641.0	9.7	640.5	8.0	639.5	8.0	640.5	9.7
		RF 1yr	639.8		639.3		625.5		632.5		626.7	
		RF 2yrs	634.5		646.8		646.8		640.7		640.4	

Table 3.2

Results for the Test of Significance of Within and Between-Subjects Effects When Schools are Categorized by Per Pupil Expenditure Levels

Source	Sum of Squares	df	Mean Square	F	Sig.
Tests of Between-Subjects Effects					
Intercept	96904027.36	1	96904027.36	195051.58	0.00
RF_Category	4798.23	2	2399.11	4.83	0.01
eMINTS_Category	566.24	2	283.12	0.57	0.57
PPE	5311.33	2	2655.66	5.35	0.00
RF_Category * eMINTS_Category	1078.79	4	269.70	0.54	0.70
RF_Category * PPE	2247.16	4	561.79	1.13	0.34
eMINTS_Category * PPE	3954.97	4	988.74	1.99	0.09
RF_Category * eMINTS_Category * PPE	4316.24	5	863.25	1.74	0.12
Error	477933.45	962	496.81		
Tests of Within-Subjects Effects					
Year	514.02	4	128.51	1.84	0.12
Year * RF_Category	636.90	8	79.61	1.14	0.33
Year * eMINTS_Category	945.24	8	118.16	1.69	0.10
Year * PPE	1035.03	8	129.38	1.85	0.06
Year * RF_Category * eMINTS_Category	1909.16	16	119.32	1.71	0.04
Year * RF_Category * PPE	3032.70	16	189.54	2.71	0.00
Year * eMINTS_Category * PPE	2422.81	16	151.43	2.16	0.00
Year * RF_Category * eMINTS_Category * PPE	2719.60	20	135.98	1.94	0.01
Error(Year)	269159.33	3848	69.95		

Note: "Year" represents the Mean MAP Score each year

As presented in Table 3.2, the results of the univariate analyses of variance (ANOVA) of the means obtained on the third grade Communication Arts MAP scores indicated that the four-way interaction **Year * RF_Category * eMINTS_Category * PPE** was significant. The table indicated that for different per pupil expenditure (PPE) levels, there were significantly different results by year for various combinations of Reading First and eMINTS categories. Graphing these interactions was difficult;

therefore, three separate sets of plots for each of the High, Medium and Low PPE levels were created (i.e., for each PPE level ANOVA plots for Year by eMINTS by RF were generated). These graphs are provided on the next pages.

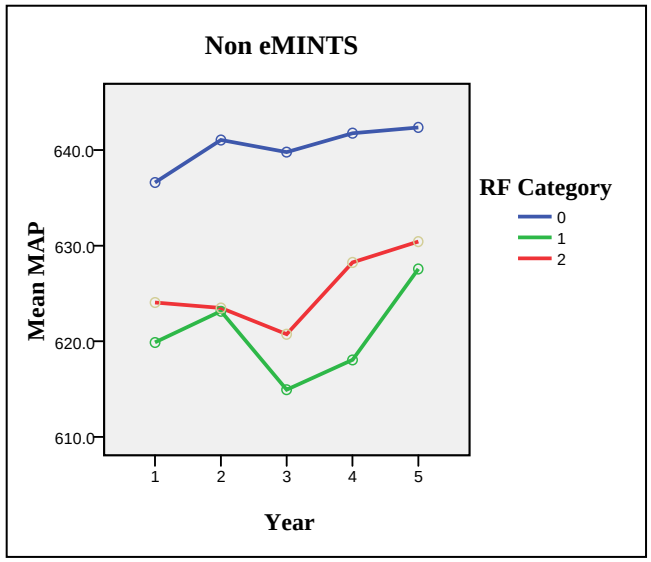

Figure 3.1.1. High PPE * non eMINTS * RF Category

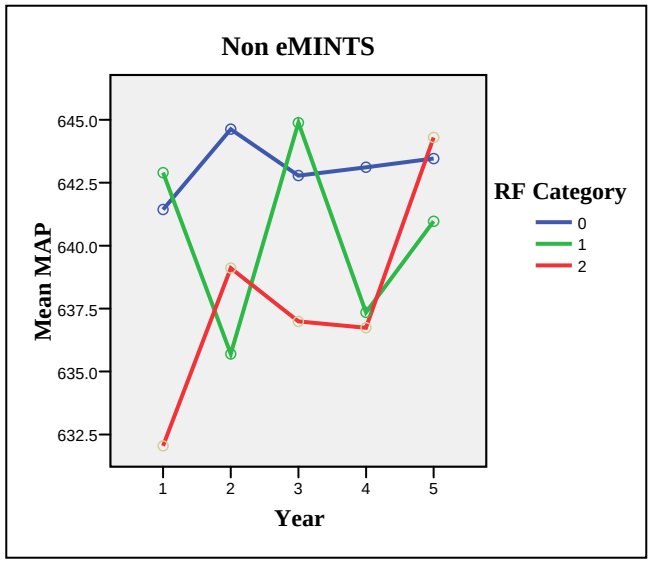

Figure 3.1.2. Medium PPE * non eMINTS * RF Category

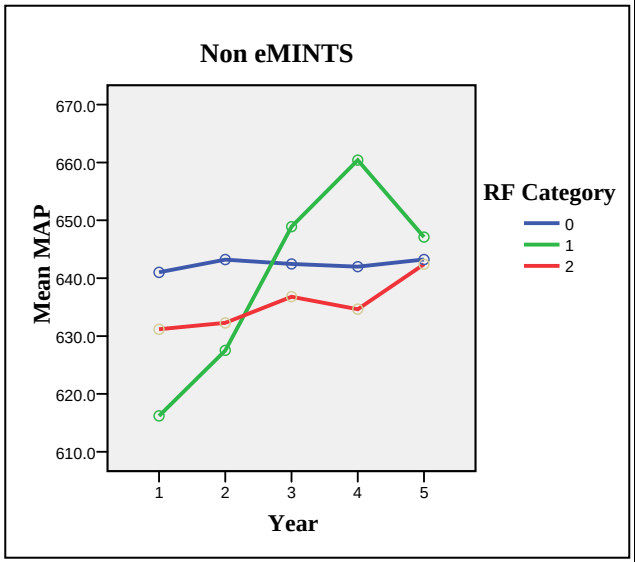

Figure 3.1.3. Low PPE * non eMINTS * RF Category

The above set of graphs is for non eMINTS schools analyzed by High, Medium, and Low PPE. Each graph was examined for schools not in Reading First (RF 0). Over the 5 years of the study, the High PPE schools experienced moderate gains and performed better than the other PPE schools. Medium PPE schools performed the best throughout all 5 years, while Low PPE schools performed equivalent to High PPE.

Next, the RF 1 schools were analyzed. Among the High PPE schools, RF 1 performed lower than RF 0 and RF 2 schools. After entering Reading First in year 4, RF 1 schools scores increased considerably in year 5. However, their performance was still below RF 0 and RF 2 schools. Among Medium RF 1 schools, the performance was erratic (Figure. 3.1.2) which resulted in lower scores than in year 1. These schools finished with lower scores than the other RF categories (Figure. 3.1.2). Nevertheless, entering the Reading First program seemed to have assisted in improved scores in year

5. Initially, Low PPE schools performed lower than the other RF categories, but over the next 3 years scores improved dramatically. In year 5, their scores dropped; however, they performed 30 points higher than their year 1 level and better than the other RF categories.

Finally, RF 2 schools were examined. High PPE schools performance was not very different from RF 1 schools in year 1. During year 2 and 3, there appeared to be a drop in scores, but after entering Reading First, the scores improved by nearly 5 mean MAP points. In analyzing Medium PPE schools, their performance improved in year 2, however, dropped in years 3 and 4. As depicted in the graph, Medium PPE had tremendous success after participating for 2 years in the Reading First grant. By year 5, these schools performed better than their year 1 score and other RF categories. Among the Low PPE schools, performance improved slightly over the first 2 years. After the second year of participating in Reading First, scores improved and by year 5, they were performing 10 points better than year 1.

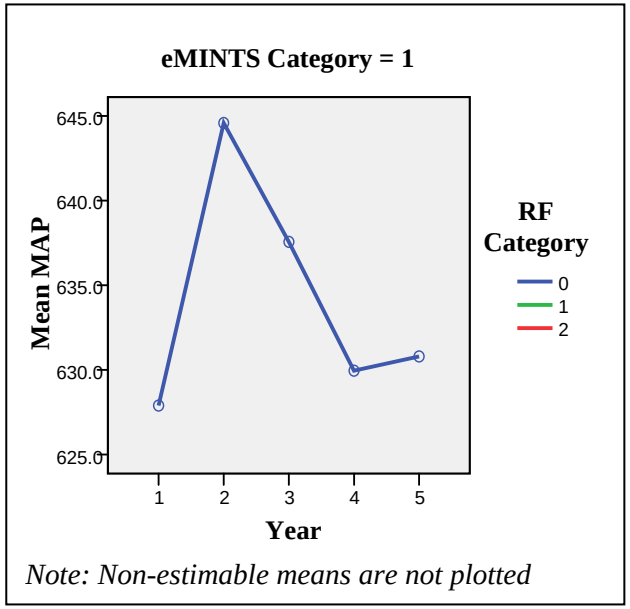

Figure 3.2.1. High PPE * eMINTS = 1 * RF Category

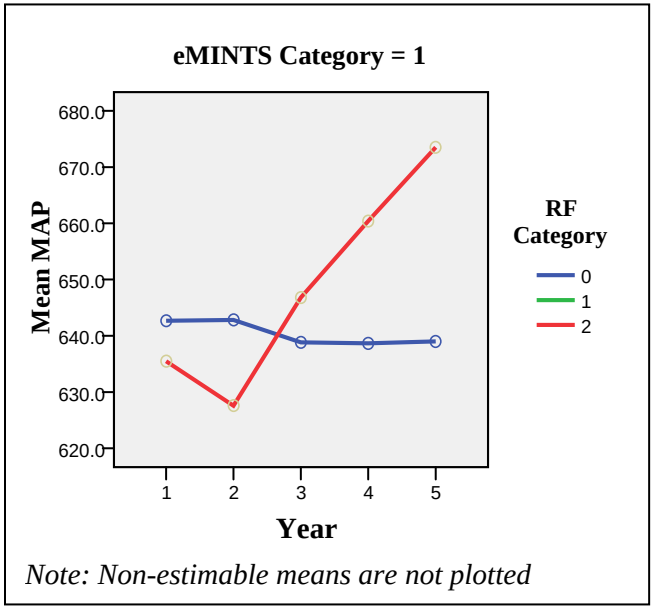

Figure 3.2.2. Medium PPE * eMINTS = 1 * RF Category

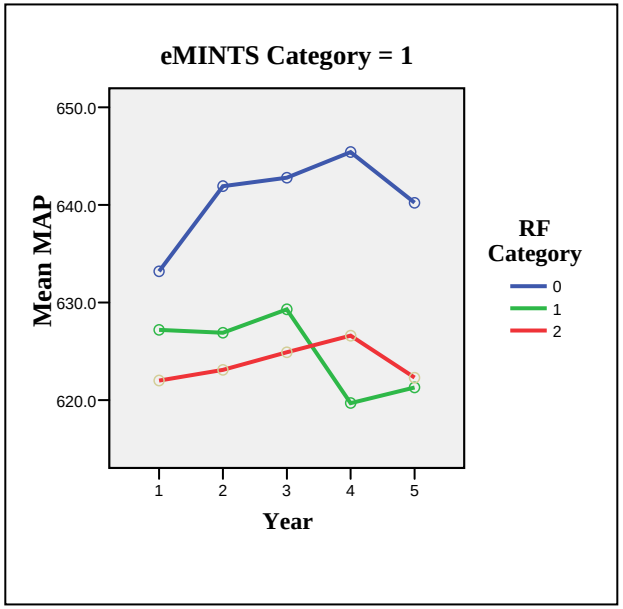

Figure 3.2.3. Low PPE * eMINTS = 1 * RF Category

The above set of graphs is for schools that were in eMINTS for only 1 year during the entire period of this study. The graphs are separated into High, Medium and Low PPE categories.

The first group of schools analyzed were the RF 0 schools. From Figure 3.2.1 it is evident that the performance of the High PPE category were much better in year 2 as compared to year 1; however, scores dropped for two consecutive years before a marginal increase in year 5. By year 5, RF 0 schools performed slightly better than year 1. Among the Medium PPE schools the performance of the non RF schools had little change over the 5-year period of the study. The Low PPE, RF 0 schools performed better in year 1 and then had a continuous improvement through year 4.

Overall, RF 0 schools performed better in year 5 than in year 1.

RF 1 category schools were the next group examined. As the Figures 3.2.1 and 3.2.2 illustrated, there were no eMINTS = 1 schools and RF 1 schools in either High PPE or Medium PPE categories. All the eMINTS = 1 and RF 1 schools were among the Low PPE schools. As evident in Figure 3.2.2, the performance of RF 1 schools improved slightly in the first 2 years. In year 3, scores dropped considerably; however, year 5 showed marginal improvement.

Finally, the RF 2 schools were considered based on PPE. There were no RF 2 schools with eMINTS = 1 over the 5-year period in the High PPE schools category. When analyzing Medium PPE schools, the RF 2 schools performed slightly lower in year 2 as compared to year 1, but year 2 revealed large improvements. By the end of the study, these schools performed 40 points above their year 1 performance. In the RF 2 Low PPE schools, the performance improved marginally in years 2, 3 and 4, but after their second year in Reading First, performance dropped back to year 1 level.

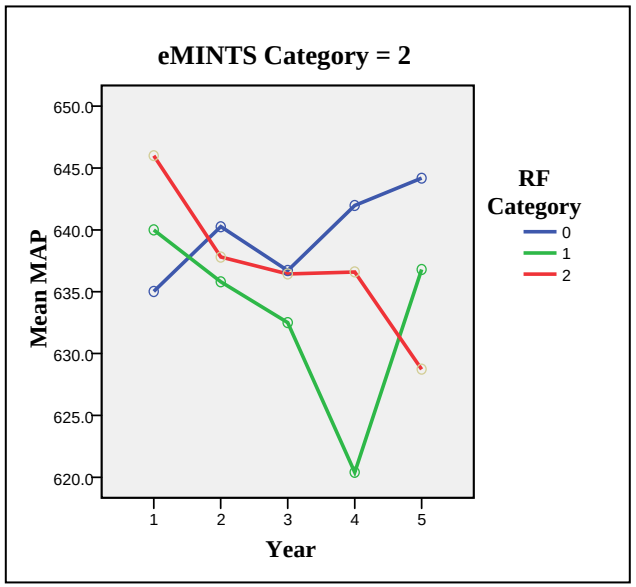

Figure 3.3.1. High PPE * eMINTS = 2 * RF Category

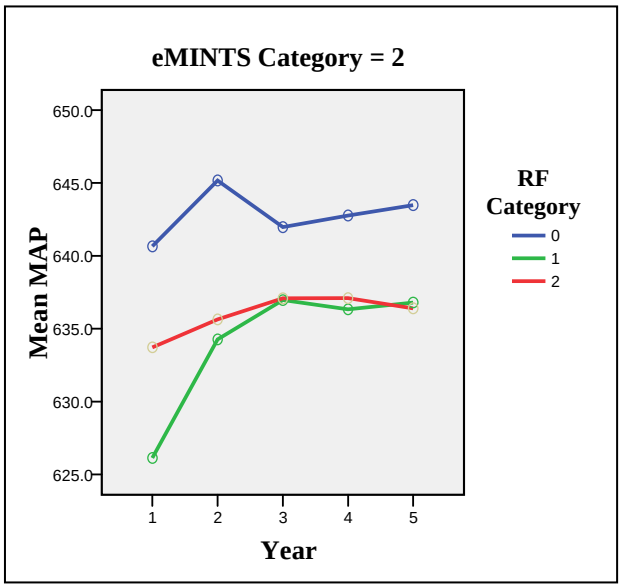

Figure 3.3.2. Medium PPE * eMINTS = 2 * RF Category

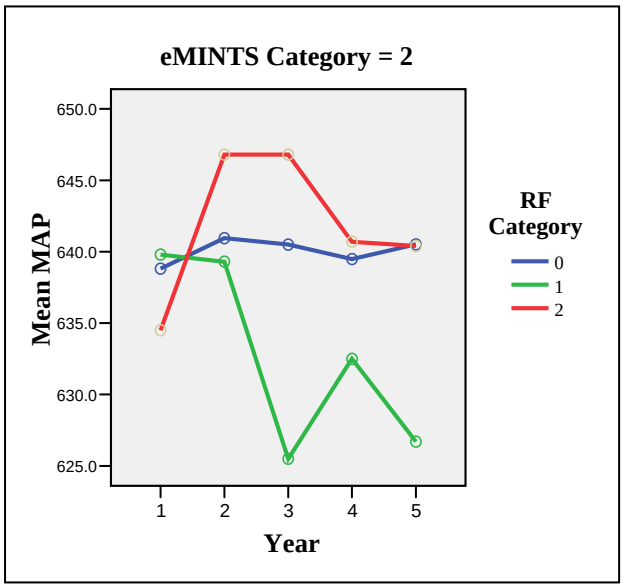

Figure 3.3.3. Low PPE * eMINTS = 2 * RF Category

The above graphs illustrate schools that were in eMINTS for 2 years or more (eMINTS = 2) over the 5-year period of this study. Again, these graphs considered the performance of schools based on High, Medium and Low PPE.

The RF 0 schools were analyzed with 2 or more years of eMINTS. Schools in this category, with High PPE, were the lowest performing schools in year 1. After year 1, the scores improved through year 5, even though there was a drop in their performance level in year 3. Among the Medium PPE schools, RF 0 schools performed higher in all the 5 years when compared to the other RF category schools. The Low PPE schools maintained their performance throughout the 5-year period.

The next group examined was the RF 1 schools with 2 or more years in eMINTS. As evident in Figure 3.3.1, the scores of High PPE schools dropped considerably from year 1 to year 4. In year 4, after the first year of implementation of the Reading First program, there was significant improvement in their performance level, whereas they performed only marginally lower than their year 1 level. Medium PPE schools improved in years 2 and 3, but remained stagnant through the end of year 5. By year 5, RF 1 schools performed much better than their year 1 level, but still lower than RF 0 schools. The performance of Low PPE schools dropped in years 2 and 3 but improved in year 4. After year 4, their performance dropped below the year 1 level.

RF 2 schools with 2 or more years of eMINTS were analyzed. In year 1, High PPE schools had their highest performance over the 5-year period and better than the other RF categories. Nevertheless, performance declined every year and in year 5, they performed lower than the other Reading First schools. Among Medium PPE schools, their performance improved slightly in years 2 and 3, but then dropped slightly in both years 4 and 5. From year 3 scores, the RF 2 schools performed at the same level as RF 1 schools even though RF 1 schools began much lower in year 1. Finally, Low PPE, RF 2 schools were not as successful as the other RF categories in year 1. However, in year 2 there was a large improvement in RF 2 schools, and even though their performance dropped in years 4 and 5, it was better than all RF categories.

Third Grade Reading Report

Percent Satisfactory and Above in Reading

As stated in the previous section, the reader should know that eMINTS 0 = Non eMINTS, eMINTS 1 = 1 year in eMINTS, and eMINTS 2 = 2 or more years in eMINTS. These categories encompass the same schools in each of the 5 years of this study. Also, as stated previously, RF 0 = Non Reading First, RF 1 = 1 year in RF (either 2004 or 2005), and RF 2 = 2 years in RF (2004 and 2005). Note that a school remained in this category for the entire period of this study. Likewise, if a school is RF 0 it was not in RF in any of the 5 years of this study). Throughout the report if a school is RF 2, it was RF in year 4 and year 5. If a school is RF 1 it was in RF in either year 4 or year 5.

The dependent variable for the Third Grade Reading Report was the percent of students performing at the satisfactory and above level in the Reading Proficiency portion of the MAP test. The dependent variable was analyzed through the three independent variables of Enrollment, F/R Lunch and PPE.

Dependent Variable: Percent of Students Performing at Satisfactory and Above in Reading/School Category: Enrollment

Table 4.1

Means and Standard Deviations of the Percent of Students Performing at a Level Satisfactory and Above in the Reading Component of MAP. Schools are Categorized by eMINTS and Reading First Participation and Enrollment Categories

Enroll	eMints Category	RF Category	2001		2002		2003		2004		2005	
			Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
High	Non eMINTS	Non RF	72.8	14.9	78.5	13.7	75.0	14.2	76.1	13.8	77.8	13.9
		RF 1 yr	52.0	22.0	57.1	16.5	47.2	21.2	49.9	15.1	62.0	19.2
		RF 2 yrs	53.9	13.9	55.9	14.6	47.8	18.1	56.0	17.9	58.1	17.7
	eMINTS 1Yr	Non RF	67.4	11.1	76.8	8.7	76.7	10.6	73.7	9.6	74.2	12.0
		RF 1 yr	55.6		63.3		62.1		55.8		52.3	
		RF 2 yrs	51.4		53.0		47.7		55.1		52.0	
	eMINTS 2+ Yrs	Non RF	73.3	11.0	77.7	11.4	73.4	11.7	74.5	10.5	77.4	10.7
		RF 1 yr	71.3	9.4	77.1	0.5	63.2	8.8	69.7	4.2	71.2	12.2
		RF 2 yrs	69.6	6.7	74.6	13.3	69.1	5.6	71.0	4.7	66.3	6.6
Low	Non eMINTS	Non RF	73.0	17.2	78.8	15.4	74.4	15.7	76.9	16.6	77.6	16.0
		RF 1 yr	70.4	6.7	59.1	12.9	71.9	13.0	75.3	14.2	67.2	12.0
		RF 2 yrs	61.3	18.1	74.4	19.5	66.4	18.7	78.6	16.5	81.7	11.4
	eMINTS 1Yr	Non RF	78.2	13.6	83.0	3.1	65.3	18.5	73.6	15.9	74.6	8.2
		RF 2 yrs	83.3		66.7		88.9		100.0		100.0	
	eMINTS 2+ Yrs	Non RF	74.9	14.0	76.6	17.5	76.7	13.0	78.7	13.5	76.2	14.4
		RF 1 yr	66.7		80.0		58.8		47.8		73.3	
		RF 2 yrs	70.0	14.1	75.7	13.5	69.9	8.5	74.1	9.6	64.9	17.6

Table 4.2

Results for the Test of Significance of Within and Between-Subjects Effects When Schools are Categorized by Enrollment Levels

Source	Sum of Squares	df	Mean Square	F	Sig.
Tests of Between-Subjects Effects					
Intercept	966612.91	1	966612.9	1652.48	0.00
RF_Category	6496.01	2	3248.0	5.55	0.00
eMINTS_Category	1788.09	2	894.0	1.53	0.22
Enroll	4412.28	1	4412.3	7.54	0.01
RF_Category * eMINTS_Category	3330.17	4	832.5	1.42	0.22
RF_Category * Enroll	5153.23	2	2576.6	4.40	0.01
eMINTS_Category * Enroll	4393.37	2	2196.7	3.76	0.02
RF_Category * eMINTS_Category * Enroll	6081.81	3	2027.3	3.47	0.02
Error	553360.72	946	584.9		
Tests of Within-Subjects Effects					
Year	552.51	4	138.1	1.25	0.29
Year * RF_Category	755.84	8	94.5	0.85	0.56
Year * eMINTS_Category	1167.73	8	146.0	1.32	0.23
Year * Enroll	171.53	4	42.9	0.39	0.82
Year * RF_Category * eMINTS_Category	3113.46	16	194.6	1.76	0.03
Year * RF_Category * Enroll	953.58	8	119.2	1.08	0.38
Year * eMINTS_Category * Enroll	813.91	8	101.7	0.92	0.50
Year * RF_Category * eMINTS_Category * Enroll	1995.63	12	166.3	1.50	0.12
Error(Year)	419381.08	3784	110.8		

As evident from Table 4.2, the four-way interaction is not significant. However, as presented in Table 1.2, the results of the univariate analyses of variance (ANOVA) of the means obtained on the third grade Reading Proficiency portion, MAP scores indicated that the three-way interaction **Year * RF_Category * eMINTS_Category** was significant. This means that for different eMINTS categories, different Reading First

category schools had a significantly different percentage of students at a level satisfactory and above in the reading component of the MAP test.

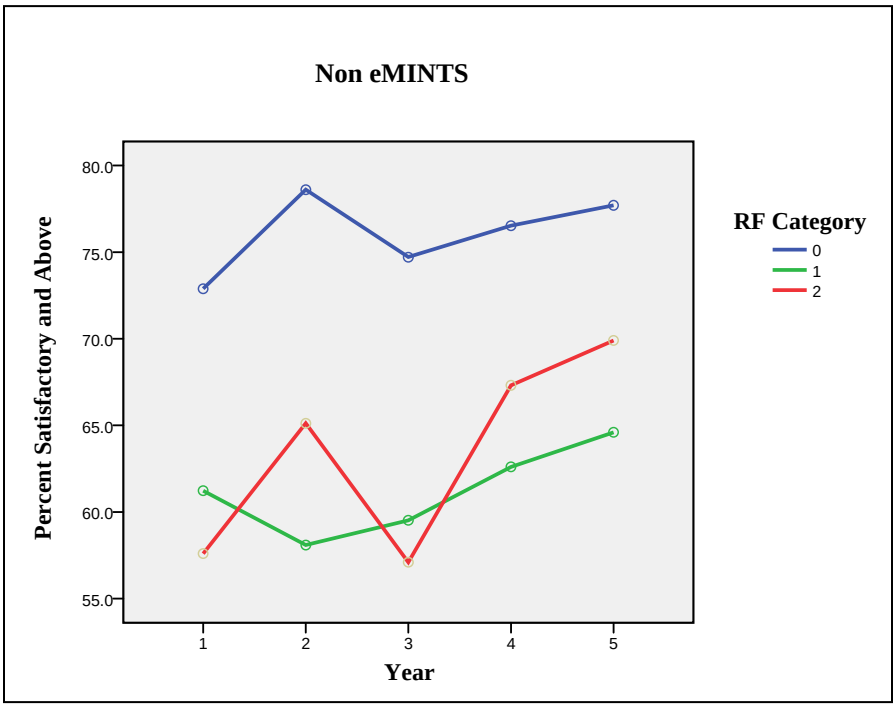

Figure 4.1.1. Year * Non eMINTS * RF Category

Figure 4.1.1 illustrates the non eMINTS schools and how the different RF categories performed. Based on the graph, non RF (RF 0) schools performed substantially better than other RF categories throughout the 5-year period.

As can be seen from the graph, RF 1 school's performance declined in year 2 as compared to year 1. Performance steadily improved and by year 5 they performed better than their year 1 level. However, by the end of the 5 years, they still performed below the other two RF categories.

The biggest gain over the 5-year period was experienced by the RF 2 schools. Their performance improved in year 2 but dropped in year 3. However, after entering

Reading First their performance improved considerably over years 4 and 5. By year 5, there was a 13 percent increase of students performing satisfactory and above on the reading proficiency portion of the MAP test.

On the whole, there appeared to be a positive trend in the schools' performances. Reading First schools did not perform as well as non RF schools throughout the 5-year period, but still profited from the Reading First program.

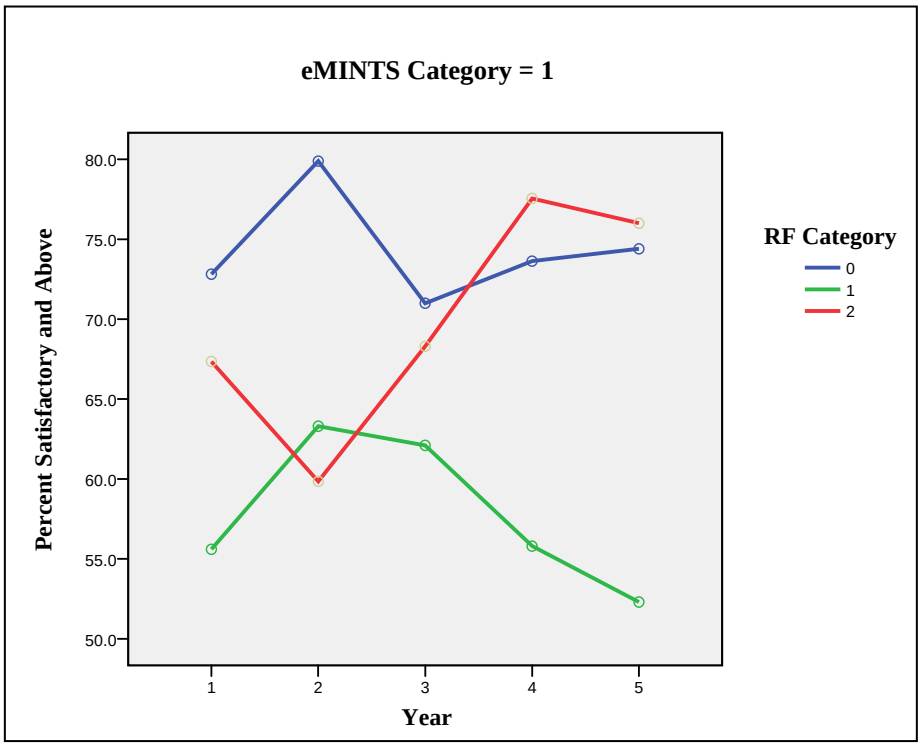

Figure 4.1.2. Year * eMINTS = 1 * RF Category

Figure 4.1.2 illustrates schools that were in eMINTS for only 1 year during the entire period of this study.

All three RF categories had substantially different performance profiles over the 5-year period. eMINTS = 1, RF 0 schools performed the best in the first three years even

though each RF category achieved different results. In year 2, RF 0 and RF 1 schools performed better than RF 2.

In year 3, RF 0 schools declined nearly 10 percent from year 2, but gradually improved up to their year 1 level.

RF 1 schools peaked in year 2 and then declined over the last 3 years. During the 3 year slide, RF 1 schools dropped nearly 10 percent from 63 percent to 53 percent. By year 5, they performed below their year 1 level.

Following a decline of nearly 8 percent, RF 2 schools rebounded and improved their performance in years 3 and 4 with approximately an 18 percent increase. In year 5, however, their performance saw a slight drop. After the 5-year period, RF 2 schools performed much better than in year 1 and better than the other RF categories.

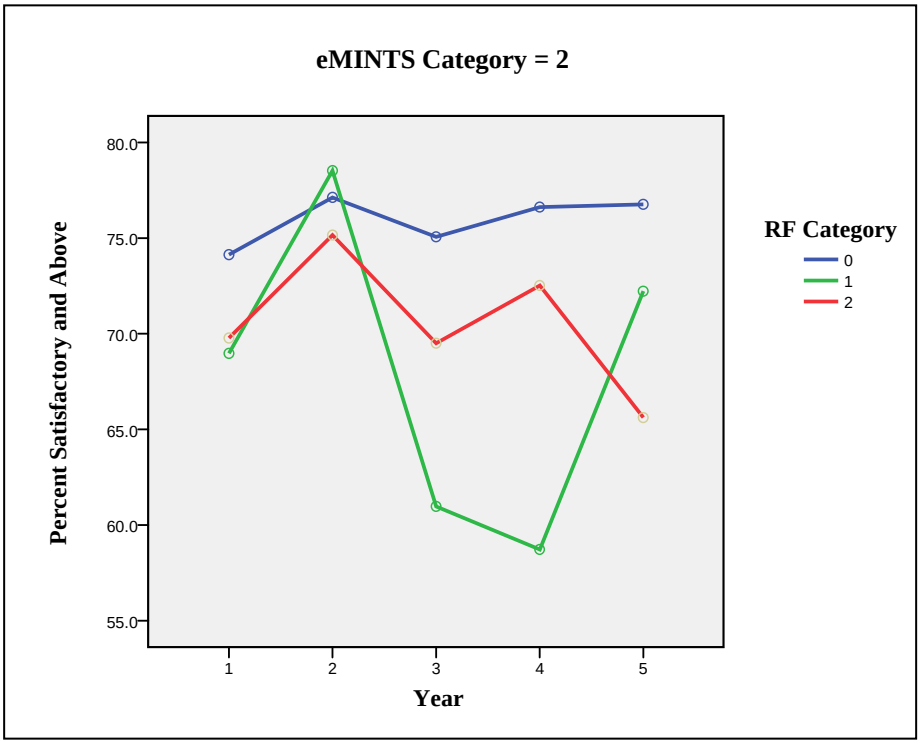

Figure 4.1.3. Year * eMINTS = 2 * RF Category

As evident in Figure 4.1.3, schools that were in eMINTS for two or more years during the entire period of the study were analyzed. RF 0 schools stayed consistent throughout the study with a 2 percent gain in the number of students that performed at the satisfactory and above level.

RF 1 schools had a much higher percentage of students at satisfactory and above in year 2 as compared to year 1. In years 3 and 4, RF1 schools had a dramatic decrease of 20 percent in reading performance and by year 4, these schools performed 12 percent below the RF 2 schools and 20 percent below the RF 0 schools. However, after entering Reading First, their performance improved substantially to a level slightly above their year 1 level.

The graph for RF 2 schools exhibited a period of fluctuation in years 1 and 5. Throughout the 5-year period the performance of RF 2 schools fluctuated. By year 5, there was nearly a 7.5 percent drop below the performance of their year 1 level.

Dependent Variable: Percent of Students Performing at Satisfactory and Above in Reading/School Category: Free and Reduced Lunch Percentage

Table 5.1

Means and Standard Deviations of the Percent of Students Performing at a Level Satisfactory and Above in the Reading Component of MAP. Schools are Categorized by eMINTS and Reading First Participation and Percent Free and Reduced Categories

% Free & Reduced	eMINTS Category	RF Category	2001		2002		2003		2004		2005	
			Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
High	Non eMINTS	Non RF	65.7	16.9	71.2	16.2	68.1	16.5	71.1	17.1	73.2	16.9
		RF 1yr	53.4	20.4	56.3	14.8	49.8	21.7	54.8	19.6	63.5	18.8
		RF 2yrs	56.5	15.6	62.9	18.9	56.1	20.1	64.5	19.8	67.2	18.6
	eMINTS 1yr	Non RF	65.3	12.7	74.8	9.9	73.1	14.7	74.9	11.3	71.3	12.1
		RF 1yr	55.6		63.3		62.1		55.8		52.3	
		RF 2yrs	67.4	22.6	59.9	9.7	68.3	29.1	77.6	31.7	76.0	33.9
	eMINTS 2+yrs	Non RF	70.6	14.4	74.7	14.1	71.9	12.7	73.9	11.4	74.9	11.8
		RF 1yr	64.8	10.3	72.7	7.6	62.9	5.9	63.6	11.4	71.7	8.5
		RF 2yrs	69.8	11.0	72.2	12.4	68.3	7.2	72.2	9.0	65.7	15.3
Low	Non eMINTS	Non RF	78.2	10.9	84.0	8.4	80.0	9.9	79.9	10.3	81.3	10.2
		RF 1yr	73.7	14.5	67.7	16.8	76.8	14.6	66.2	9.2	67.6	18.4
		RF 2yrs	71.1	14.7	80.2	9.4	71.2	23.8	78.4	18.0	86.3	10.9
	eMINTS 1yr	Non RF	74.9	9.3	79.7	7.3	76.6	8.1	72.3	10.0	79.7	6.1
	eMINTS 2+yrs	Non RF	77.1	9.3	81.0	10.3	76.7	12.2	77.2	9.9	80.6	9.4
		RF 1yr	64.6		76.7		69.4		72.6		79.8	
		RF 2yrs	68.3	9.5	81.7	10.3	71.6	7.1	73.3	2.7	71.3	3.1

Table 5.2

Results for the Test of Significance of Within and Between-Subjects Effects When Schools are Categorized by Percent Free and Reduced Levels

Source	Sum of Squares	df	Mean Square	F	Sig.
Tests of Within-Subjects Effects					
Year	890.11	4	222.53	2.05	0.08
Year * RF_Category	421.93	8	52.74	0.49	0.87
Year * eMINTS_Category	420.22	8	52.53	0.48	0.87
Year * F/R	191.85	4	47.96	0.44	0.78
Year * RF_Category * eMINTS_Category	1916.81	16	119.80	1.10	0.34
Year * RF_Category * F/R	496.57	8	62.07	0.57	0.80
Year * eMINTS_Category * F/R	796.59	8	99.57	0.92	0.50
Year * RF_Category * eMINTS_Category * F/R	364.46	8	45.56	0.42	0.91
Error(Year)	446761.65	4116	108.54		
Tests of Between-Subjects Effects					
Intercept	1150027.56	1	1150027.56	2462.04	0.00
Year * RF_Category	4950.75	2	2475.38	5.30	0.01
Year * eMINTS_Category	905.95	2	452.98	0.97	0.38
Year * F/R	6607.44	1	6607.44	14.15	0.00
Year * RF_Category * eMINTS_Category	777.01	4	194.25	0.42	0.80
Year * RF_Category * F/R	164.47	2	82.24	0.18	0.84
Year * eMINTS_Category * F/R	2235.66	2	1117.83	2.39	0.09
Year * RF_Category * eMINTS_Category * F/R	478.33	2	239.17	0.51	0.60
Error	480648.83	1029	467.10		

Based on the data from Table 5.2, none of the within subject effects were significant. Therefore, the between-subjects effects were examined and it was apparent that the different **Year * F/R** categories had a significantly different percentage of students in the satisfactory and above level of reading proficiency.

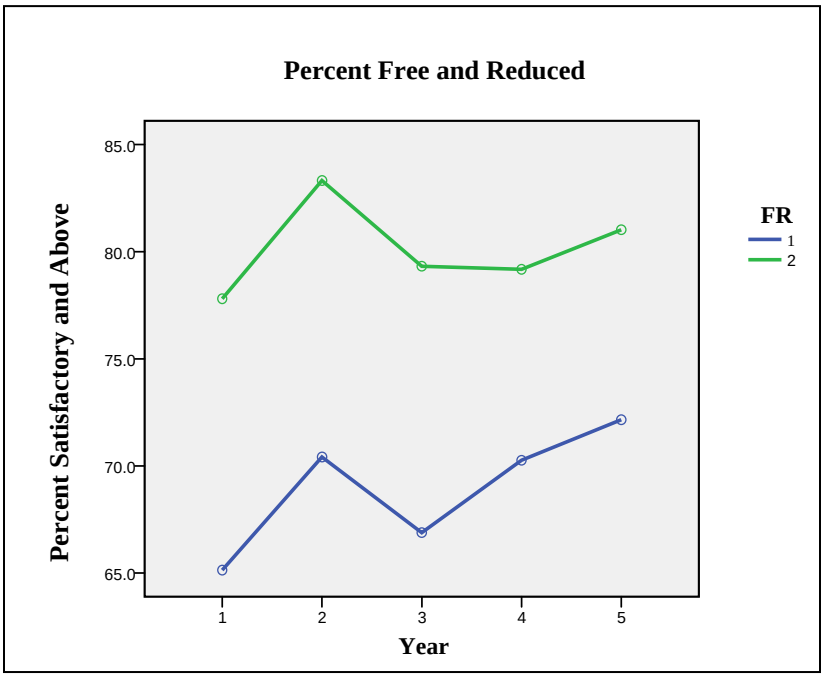

Figure 5.1.1. Year * F/R Category

Figure 5.1.1 reveals the graph of free and reduced percentages. Based on the graph, High F/R schools had fewer students performing at the satisfactory and above proficiency level of the MAP test than the Low F/R schools throughout the 5-year period of the study.

Dependent Variable: Percent of Students Performing at Satisfactory and Above in Reading/School Category: Per Pupil Expenditure

Table 6.1

Means and Standard Deviations of the Percent of Students Performing at a Level Satisfactory and Above in the Reading Component of MAP. Schools are Categorized by eMINTS and Reading First Participation and Per Pupil Expenditure Categories

PPE	RF Category	eMINTS Category	2001		2002		2003		2004		2005	
			Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
High	Non RF	Non eMINTS	68.61	18.59	76.37	17.34	71.11	17.62	75.38	16.61	76.15	17.95
		eMINTS 1yr	61.22	8.45	77.22	7.77	69.58	13.00	62.18	14.94	63.20	8.37
		eMINTS 2+yrs	69.03	20.41	75.01	15.97	68.15	18.54	74.44	13.71	79.84	12.87
	RF 1yr	Non eMINTS	51.51	20.64	54.71	15.05	44.19	17.77	48.84	14.51	60.20	17.98
		eMINTS 2+yrs	66.70		80.00		58.80		47.80		73.30	
	RF 2yrs	Non eMINTS	55.41	16.08	56.30	17.38	48.61	19.05	61.38	22.43	59.92	19.01
		eMINTS 2+	78.70	14.22	73.20	12.76	66.33	2.27	66.20	3.22	60.07	21.82
Medium	Non RF	Non eMINTS	75.30	13.02	80.07	12.03	76.89	12.99	76.80	13.65	78.57	12.52
		eMINTS 1	76.47	10.99	78.15	7.05	71.22	12.91	72.37	8.23	76.78	10.11
		eMINTS 2+	74.95	10.93	79.40	12.75	75.19	10.80	76.35	10.77	78.40	11.09
	RF 1yr	Non eMINTS	76.40	12.15	64.70	16.68	81.45	15.28	75.08	12.44	76.22	19.20
		eMINTS 2+	59.67	5.78	70.00	6.70	68.43	1.06	70.87	5.22	76.87	7.54
	RF 2yrs	Non eMINTS	61.13	16.56	75.83	15.96	68.00	18.54	73.84	15.53	81.09	11.35
		eMINTS 1	83.30		66.70		88.90		100.00		100.00	
		eMINTS 2+	67.05	8.26	73.75	13.16	69.62	7.84	73.71	8.32	68.08	12.19
Low	Non RF	Non eMINTS	74.24	11.19	78.32	10.33	76.59	9.42	76.33	10.79	78.84	10.01
		eMINTS 1	65.11	11.52	74.33	11.90	80.47	10.87	79.69	7.10	75.82	10.42
		eMINTS 2+	73.39	9.91	76.26	11.41	74.44	9.88	72.95	9.42	75.72	10.40
	RF 1yr	Non eMINTS	38.90		67.10		83.70		90.10		80.00	
		eMINTS 1	55.60		63.30		62.10		55.80		52.30	
		eMINTS 2+	77.90		77.40		56.90		66.70		62.50	
	RF 2 yrs	Non eMINTS	64.53	4.82	69.53	8.30	69.33	2.47	62.77	6.99	77.63	8.24
		eMINTS 1	51.40		53.00		47.70		55.10		52.00	
		eMINTS 2+	59.10		85.70		77.60		73.20		72.30	

Table 6.2

Results for the Test of Significance of Within and Between-Subjects Effects When Schools are Categorized by Per Pupil Expenditure Levels

Source	Sum of Squares	df	Mean Square	F	Sig.
Tests of Within-Subjects Effects					
Year	875.08	4	218.77	2.01	0.09
Year * PPE	1940.77	8	242.60	2.23	0.02
Year * RF Category	234.61	8	29.33	0.27	0.98
Year * eMINTS Category	1624.26	8	203.03	1.86	0.06
Year * PPE * RF_ Category	4450.12	16	278.13	2.55	0.00
Year * PPE * eMINTS_Category	2207.07	16	137.94	1.27	0.21
Year * RF_Category * eMINTS_Category	2774.95	16	173.43	1.59	0.06
Year * PPE * RF_Category * eMINTS_Category	2905.87	20	145.29	1.33	0.15
Error(Year)	419193.47	3848	108.94		
Tests of Between-Subjects Effects					
Intercept	1149164.50	1	1149164.50	2028.93	0.00
Year * PPE	9806.91	2	4903.45	8.66	0.00
Year * RF_Category	5966.46	2	2983.23	5.27	0.01
Year * eMINTS_Category	674.78	2	337.39	0.60	0.55
Year * PPE * RF_Category	4645.14	4	1161.29	2.05	0.05
Year * PPE * eMINTS_Category	5532.82	4	1383.21	2.44	0.09
Year * RF_Category * eMINTS_Category	1050.19	4	262.55	0.46	0.76
Year * PPE * RF_Category * eMINTS_Category	5245.14	5	1049.03	1.85	0.10
Error	544867.11	962	566.39		

As evident from Table 6.2 in the test of within-subjects effects, the four-way interaction **Year * PPE * RF_Category * eMINTS_Category** was not significant. However, the three-way interaction **Year * PPE * RF_Category** was significant (i.e., in different years the performances of different combinations of RF and eMINTS were significantly different). The graphs below illustrate this effect.

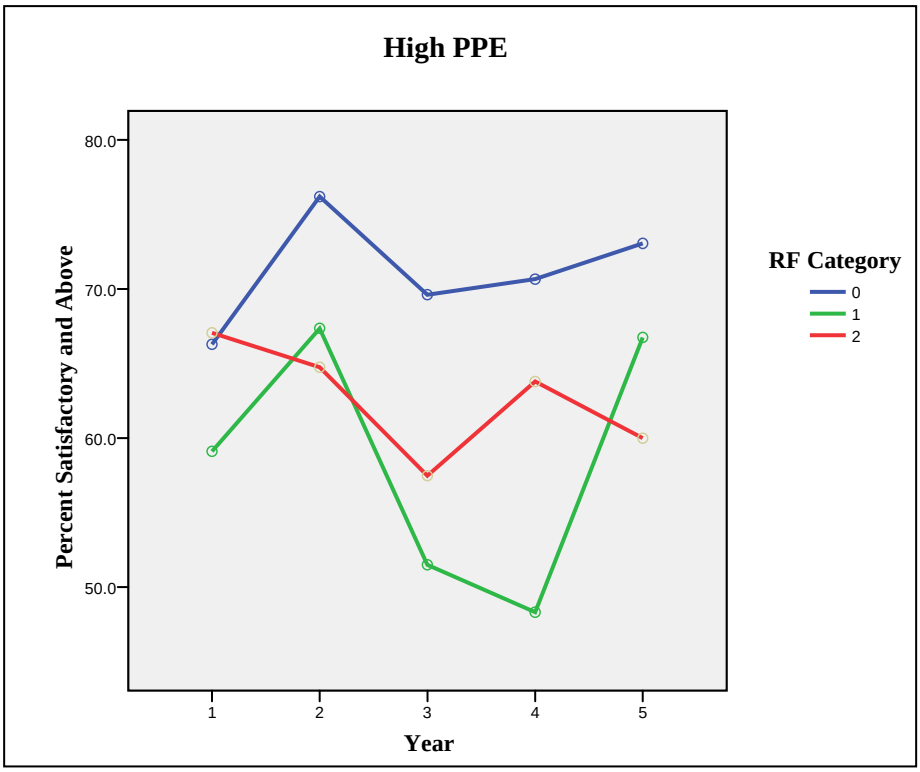

Figure 6.1.1. Year * High PPE * RF Category

Figure 6.1.1 above depicts the percentage of students in High PPE schools that were in different RF categories performing at a level satisfactory and above in the Reading component of the MAP test.

Based on the graph, RF 0 schools had the same percentage of students scoring at satisfactory and above as the RF 2 schools. Both schools were approximately 7 percent above the RF 1 schools. In year 2, the performance of RF 0 schools declined, but improved in years 4 and 5. By the end of year 5, the percentage of students scoring satisfactory and above was about 7 percent higher than year 1.

In year 1, the RF 1 schools had the lowest overall performance, but improved in year 2. After years 2 and 3, the percent of students performing at satisfactory and above

decreased substantially. However, in years 4 and 5 the percentage of students performing at satisfactory and above increased by nearly 20 percentage. After entering the Reading First program, scores increased 7 percent above their year 1 level and about 5 percent higher than RF 2 by the end of the study.

The RF 2 schools experienced a decline in the percentage of students performing at satisfactory and above in years 2 and 3, but improved in year 4. In year 5, RF 2 schools' percentage dropped which caused them to finish about 8 percent lower than their year 1 level and about 12 percent below RF 0 schools.

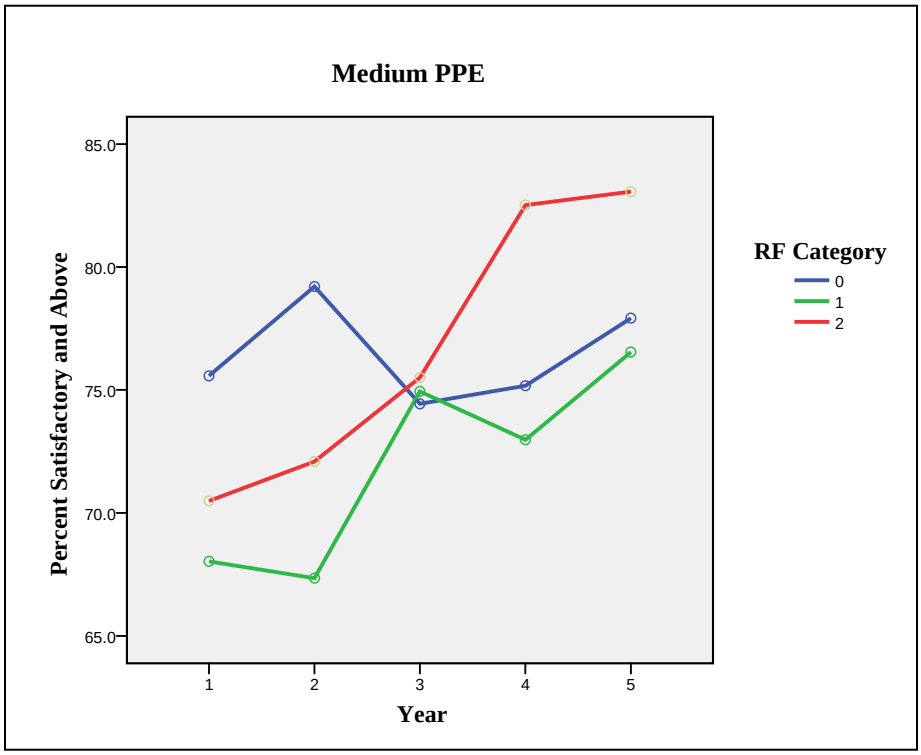

Figure 6.1.2. Year * Medium PPE * RF Category

Medium PPE schools are analyzed in Figure 6.1.2. As evident from the graph, RF 0 schools performed the best in years 1 and 2. By year 3, RF 0 schools declined by nearly

7 percent and fell to the same level as the other RF categories. In years 4 and 5 schools improved and by year 5 they were performing at their year 1 level.

RF 1 schools had the lowest percentage of students at satisfactory and above in year 1. During year 2 there was a small decrease, but in year 3 there was an 8 percent rebound. After another drop in year 4, RF 1 schools finished year 5 with a 9 percent increase over year 1.

From year 1 to year 5, RF 2 schools had the largest gain over the 5-year period. In year 1, the performance of RF 2 schools fell between the performance of RF 0 and RF 1 schools. RF 2 schools improved dramatically over the period of the study. By year 5, the percent of students scoring at satisfactory and above went from 68 percent to 73 percent. This gain was nearly 15 percent more than their year 1 level and was better than any other RF category.

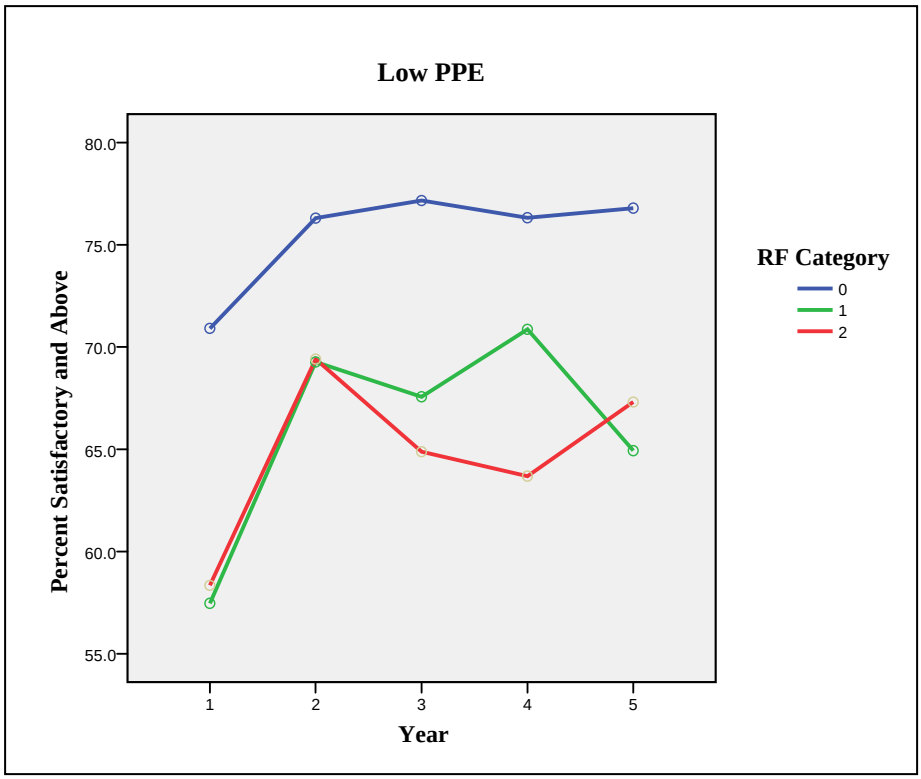

Figure 6.1.3. Year * Low PPE * RF Category

Figure 6.1.3 illustrates Low PPE schools. As evident from the graph, RF 0 schools performed better than all RF categories in the 5 years of this study. From year 1 to year 5, RF 0 steadily improved to finish nearly 7 percent above year 1.

Based on the analysis, RF 1 and RF 2 schools performed the same through year 2. In year 3, the percentage of students performing at satisfactory and above on the reading portion of the MAP test decreased in both the RF 1 and RF 2 categories.

After year 2, RF 1 schools had a slight decrease, but increased in year 4. By year 5, the percentage of students meeting proficiency declined nearly 7 percent and finished 12 percent less than the RF 0 schools.

RF 2 scores dropped over the next two years. After entering the Reading First program in year 4, RF 2 schools increased in performance by nearly 11 percent above year 1. Nevertheless, RF2 schools finished 10 percent less than RF 0 schools.

Fourth Grade Report

It is beneficial to know that eMINTS is implemented in the fourth grade. For the purpose of this research, Mathematics was the only MAP area analyzed in the fourth grade.

In the process of analyzing eMINTS and understanding figures, the reader should know that 0 = Non eMINTS, 1 = 1 year in eMINTS, and 2 = 2 or more years in eMINTS. These categories encompass the same schools in each of the 5 years of this study.

The dependent variable for the Fourth Grade Report section was the mean MAP score which was considered through the three independent variables of Enrollment, F/R Lunch and PPE. Schools that had an enrollment greater than 796 were classified as High Enrollment schools and those that had an enrollment less than 494 were classified as Low Enrollment schools. The distribution for enrollment was 817 High Enrollment schools (High = 817), 213 Low Enrollment schools (Low = 213), while 99 school buildings were excluded from the study. The free and reduced variable had a mean average of 51.05 with a standard deviation of 24.56. Schools with a F/R percentage less than 50.72 were classified as Low F/R and schools with a F/R percentage greater than 51.38 were classified as High F/R. Based on the distribution of F/R schools, there were 552 schools identified as High free and reduced (High F/R = 552), 568 identified as Low free and reduced (Low F/R = 568) and 9 schools excluded from the category. In the area of PPE, schools with expenditures greater than or equal to $7,164.90 were categorized as High

PPE schools, schools with expenditures between $5,911.70 and $7,055.40 were categorized as Medium PPE, and schools with expenditures less than or equal to $5,802.30 were categorized as Low PPE schools. The distribution group for PPE resulted in 111 High PPE schools (H = 111), 229 Medium PPE schools (M = 229), and 134 Low PPE schools (L = 134), while 48 school buildings were excluded from the analysis.

Dependent Variable: Mean MAP Score/School Category: Enrollment

Table 7.1

Means and Standard Deviations of Mean MAP Scores of Schools in eMINTS and Reading First Programs for different Enrollment Categories

Enroll	eMINTS Category	2001		2002		2003		2004		2005	
		Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
High	Non eMINTS	640.5	18.6	640.7	18.8	640.8	17.7	645.1	16.3	646.3	15.5
	eMINTS 1yr	636.5	8.8	640.3	10.7	640.8	12.5	642.5	17.1	646.0	15.7
	eMINTS 2+yrs	641.8	11.2	641.7	13.4	640.4	10.7	642.0	9.7	644.5	11.0
Low	Non eMINTS	642.7	16.8	645.7	17.2	642.3	16.1	643.2	15.6	645.6	15.5
	eMINTS 1yr	638.8	12.0	639.6	8.1	643.2	19.2	641.6	13.4	646.3	8.4
	eMINTS 2+yrs	641.9	15.6	643.1	20.9	644.1	20.0	642.9	15.8	642.9	13.5

Table 7.2

Results for the Test of Significance of Within and Between-Subjects When Schools are Categorized by Enrollment Levels

Source	Sum of Squares	df	Mean Square	F	Sig.
Tests of Between-Subjects Effects					
Intercept	374581413.66	1	374581413.7	399477.12	0.00
eMINTS_Category	562.64	2	281.3	0.30	0.74
Enroll	200.08	1	200.1	0.21	0.64
eMINTS_Category * Enroll	22.20	2	11.1	0.01	0.99
Error	905798.17	966	937.7		
Tests of Within-Subjects Effects					
Year	2360.41	4	590.1	5.81	0.00
Year * eMINTS_Category	995.19	8	124.4	1.22	0.28
Year * Enroll	401.60	4	100.4	0.99	0.41
Year * eMINTS_Category * Enroll	847.92	8	106.0	1.04	0.40
Error(Year)	392545.37	3864	101.6		

Note: "Year" represents the Mean MAP score each year

On examination of the fourth grade mean MAP scores (see Table 7.2), there were no significant within-subject or between-subject differences in the mean MAP scores when schools were categorized by enrollment. In addition, based on this result, there were no significant differences in the performance levels in different years for various combinations of enrollment and eMINTS, nor were there any differences among schools in different combinations, of eMINTS and enrollment categories, over the entire 5-year period altogether.

Dependent Variable: Mean MAP Score/School Category: Free and Reduced Lunch Percentage

Table 8.1

Means and Standard Deviations of Mean MAP Scores of Schools in Different Combinations of eMINTS and Percent Free and Reduced Categories

%Free and Reduced	eMINTS Category	2001		2002		2003		2004		2005	
		Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
High	Non eMINTS	631.9	18.6	632.2	17.6	633.1	17.8	638.1	15.9	639.3	14.7
	eMINTS 1yr	634.9	10.9	639.8	11.1	642.5	15.6	644.2	18.5	646.0	15.7
	eMINTS 2+yrs	640.7	14.5	639.8	18.0	638.2	12.3	639.5	11.1	641.6	10.9
Low	Non eMINTS	649.0	12.6	649.9	14.2	648.1	12.5	650.3	13.6	651.4	13.4
	eMINTS 1yr	641.8	5.3	641.8	6.7	640.1	10.0	642.6	9.7	644.5	7.6
	eMINTS 2+yrs	644.7	10.7	645.6	11.9	644.6	12.9	644.8	11.1	647.4	10.7

Table 8.2

Results for the Test of Significance of Within and Between-Subjects When Schools are Categorized by Percent Free and Reduced Levels

Source	Sum of Squares	df	Mean Square	F	Sig.
Tests of Between-Subjects Effects					
Intercept	468660782.8	1	468660782.8	706900.22	0.00
eMINTS_Category	150.1	2	75.1	0.11	0.89
F/R	13909.7	1	13909.7	20.98	0.00
eMINTS_Category * F/R	22508.5	2	11254.2	16.98	0.00
Error	698118.1	1053	662.9		
Tests of Within-Subjects Effects					
Year	3113.8	4	778.5	7.66	0.00
Year * eMINTS_Category	2113.1	8	264.1	2.60	0.01
Year * F/R	767.3	4	191.8	1.89	0.11
Year * eMINTS_Category * F/R	1605.6	8	200.70	1.98	0.05
Error(Year)	427894.2	4212	101.6		

From Table 8.2 it is evident that the interaction **Year* eMINTS_Category * F/R** was significant. Schools performed significantly different in various combinations of

eMINTS and F/R Lunch over the 5-year period of the study. Figures 8.1.1 and 8.1.2 graph the interaction.

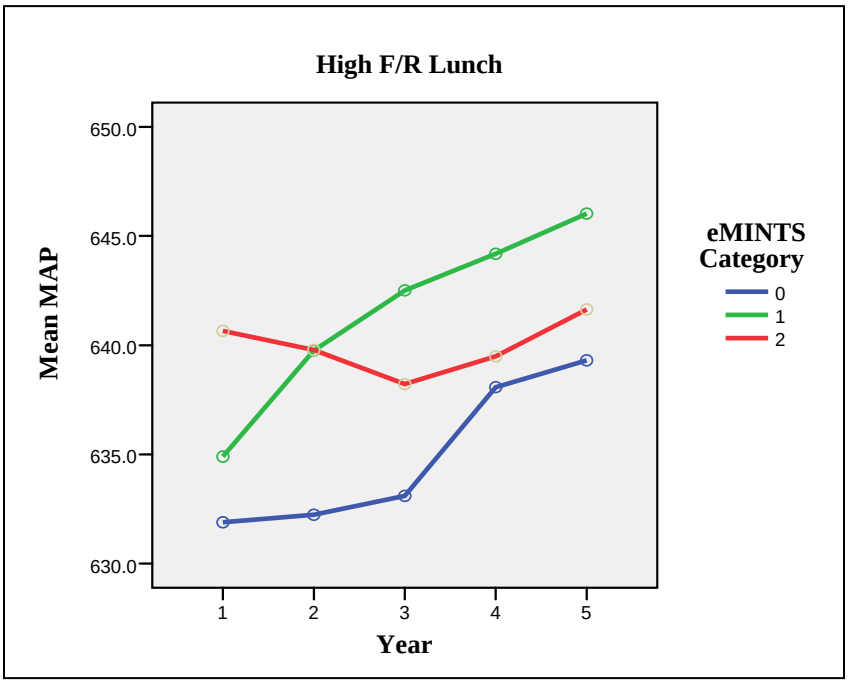

Figure 8.1.1. Year * High F/R * eMINTS Category

As evident among the High F/R schools eMINTS = 0 schools started off performing the lowest in year 1. Over the 5-year period, eMINTS = 0 schools improved every year and by year 5 was performing 6 points better than their year 1 level. However, these schools still performed below the other eMINTS category schools.

High F/R schools that had been in eMINTS for only one year over the entire 5-year period of this study improved substantially. In year 1, eMINTS = 1 schools performed below schools that had been in eMINTS for 2 or more years and slightly above eMINTS = 0 schools. Each year, eMINTS = 1 schools improved steadily

outperforming eMINTS = 2 schools. By year 5, these schools performed better than the other eMINTS categories and at least 10 points better than their year 1 level.

High F/R schools that had been in eMINTS for 2 or more years over the 5-year period of this study performed better than the other eMINTS schools. Scores decreased over years 2 and 3, but made the same improvements in years 4 and 5. By year 5, eMINTS = 2 schools were achieving at the same level as they did in year 1 and slightly better than eMINT = 0 schools.

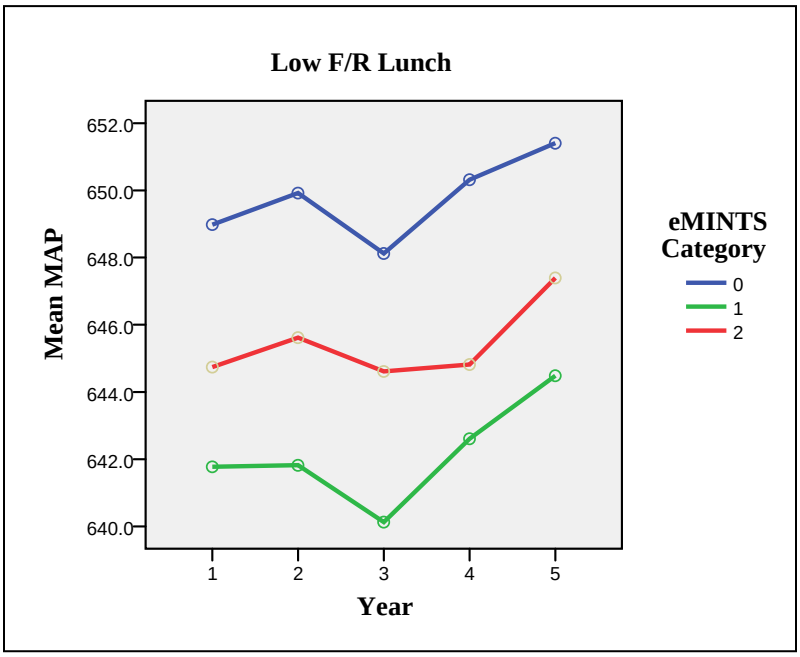

Figure 8.1.2. Year * Low F/R * eMINTS Category

Note: Scale of y-axis is pretty small.

Figure 8.1.2 above illustrates Low F/R schools. As evident on the graph, eMINTS = 0 schools performed consistently better than schools in any other eMINTS category over the 5-year period of this study. The performance of eMINTS = 0 schools decreased slightly in year 3 but improved again in years 4 and 5.

The schools in the Low F/R category that had been in eMINTS for 1 year did not perform as good as the other eMINTS categories throughout the 5-year period of this study. eMINTS = 1 schools performed at least 6 points below the non eMINTS schools in year 1. By year 5, eMINTS = 1 schools were still about 6 points behind the best performing eMINTS = 0 schools, even though they had improved marginally compared to year 1.

Throughout the 5-year period of this study, Low F/R schools that had been in eMINTS for 2+ years performed better than eMINTS = 1 schools but lower than eMINTS = 0 schools. They performed at the same level from year 1 to year 4 but improved slightly in year 5. However, eMINTS = 2 schools still performed below eMINTS = 0 schools.

Dependent Variable: Mean MAP Score/School Category: Per Pupil Expenditure

Table 9.1

Means and Standard Deviations of Mean MAP Scores of Schools in Different Combinations of eMINTS and Per Pupil Expenditure Categories

PPE	eMINTS Category	2001		2002		2003		2004		2005	
		Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
High	Non eMINTS	634.9	21.5	636.0	22.3	636.0	20.3	641.3	17.7	642.7	16.9
	eMINTS 1yr	635.0	13.5	631.5	7.0	640.8	13.9	638.7	14.9	635.7	13.9
	eMINTS 2+yrs	638.4	20.1	637.2	22.0	641.7	21.1	642.8	15.1	646.6	17.8
Medium	Non eMINTS	645.7	14.8	646.3	14.8	644.9	14.2	647.1	14.8	648.2	14.6
	eMINTS 1yr	640.1	8.2	643.3	7.7	641.3	14.0	641.4	10.2	643.8	7.9
	eMINTS 2+yrs	644.5	12.7	645.1	16.9	642.0	11.4	642.1	11.3	644.5	10.5
Low	Non eMINTS	643.3	10.9	641.4	11.4	642.1	11.2	645.8	13.3	646.8	12.2
	eMINTS 1yr	635.2	10.1	641.2	11.1	643.8	14.8	649.0	20.5	654.8	16.4
	eMINTS 2+yrs	640.4	8.2	640.2	8.9	638.4	8.9	640.7	9.5	642.4	7.7

Table 9.2

Results for the Test of Significance of Within and Between-Subjects When Schools are Categorized by Per Pupil Expenditure Levels

Source	Sum of Squares	df	Mean Square	F	Sig.
Tests of Between-Subjects Effects					
Intercept	439581906.4	1	439581906.4	519305.07	0.00
eMINTS_Category	1004.9	2	502.4	0.59	0.55
PPE	4745.1	2	2372.6	2.80	0.06
eMINTS_Category * PPE	5435.6	4	1358.9	1.61	0.17
Error	838016.3	990	846.5		
Tests of Within-Subjects Effects					
Year	4165.8	4	1041.5	10.06	0.00
Year * eMINTS_Category	1113.8	8	139.2	1.34	0.22
Year * PPE	2501.2	8	312.6	3.02	0.00
Year * eMINTS_Category * PPE	2289.3	16	143.1	1.38	0.14
Error(Year)	410124.9	3960	103.6		

As presented in Table 9.2, the results of the univariate analyses of variance (ANOVA) of the means obtained on the fourth grade Mathematics MAP scores indicated that the interaction **Year * PPE** was significant. This means that in different years schools in different PPE categories performed significantly different. The graphs below reveal the results.

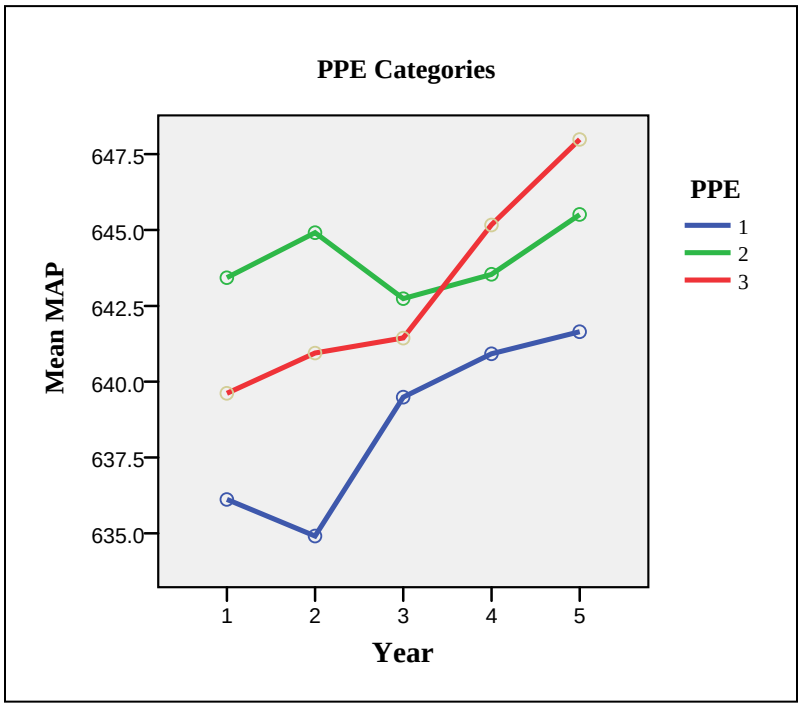

Figure 9.1.1. Year * PPE Category

Note: Scale of y-axis is pretty small.

When examining Figure 9.1.1, it was evident that the schools in the three PPE categories had very different performance profiles.

High PPE schools performed the lowest in year 1 and stayed constant over the 5-year period. Even though they dropped in year 2, they improved their performance every year. By year 5 High PPE schools performed about 4 points better than their year 1 level but still performed about 7 points below the best performing Low PPE schools.

The Medium PPE schools performed the best in year 1 and 2. Their performance dropped in year 3, but improved in years 4 and 5. At the end of the 5-year period, Medium PPE schools performed 2 points better than their year 1 level.

The Low PPE schools showed steady improvement every year in the 5-year period with the largest improvements in performance in years 4 and 5. By year 5 these schools performed the best out of the three PPE category schools and 8 points better than their year 1 level.

There was a positive trend overall in the 5 years of the study. As shown in Figure 9.1.1, Low PPE schools had the best improvement.

COMPREHENSIVE SCHOOL REFORM GRANT

The Comprehensive School Reform (CSR) grant was implemented in the middle school; hence, seventh grade Communication Arts, seventh grade Reading and eighth grade Mathematics were examined.

In the process of analyzing CSR and understanding tables and figures, the reader should know that 0 = Non CSR, 1 = 1 year in CSR, and 2 = 2 or more years in CSR. These categories encompass the same schools in each of the 5 years of this study.

The dependent variable for the Seventh and Eighth Grade Report sections was the mean MAP score which was considered through the three independent variables of enrollment, free and reduced lunch percentage (F/R) and per pupil expenditure (PPE).

Seventh Grade Report

It is beneficial to know that CSR was implemented in seventh grade. For the purpose of this research, Communication Arts and Reading Proficiency were the only MAP areas analyzed in the seventh grade.

The dependent variable for the Seventh Grade Report section was the mean MAP score which was considered through the three independent variables of Enrollment, F/R Lunch and PPE. Schools that had an enrollment greater than 796 were classified as High Enrollment schools and those that had an enrollment less than 494 were classified as Low Enrollment schools. The distribution for enrollment was 354 High Enrollment schools (High = 354), 213 Low Enrollment schools (Low = 213), while 97 school buildings were excluded from the analysis. The free and reduced variable had a mean average of 47.57 with a standard deviation of 21.75. Schools with a F/R percentage of less than 47.19 were

classified as Low F/R and schools with a F/R percentage greater than 47.94 were classified as High F/R. Based on the distribution of F/R schools, there were 303 schools identified as High free and reduced (High F/R = 303), 354 identified as Low free and reduced (Low F/R = 354) and 7 schools excluded from the category. In the area of PPE, schools with expenditures greater than or equal to $7,164.90 were categorized as High PPE schools, schools with expenditures between $5,911.70 and $7,055.40 were categorized as Medium PPE, and schools with expenditures less than or equal to $5,802.30 were categorized as Low PPE schools. The distribution group for PPE resulted in 111 High PPE schools (H = 111), 229 Medium PPE schools (M = 229), and 134 Low PPE schools (L = 134), while 48 school buildings were excluded from the analysis.

Dependent Variable: Mean MAP Score/School Category: Enrollment

Table 10.1

Means and Standard Deviations of Mean MAP Scores for Different Categories of Enrollment and CSR Participation Levels

Enroll	CSR Category	2001		2002		2003		2004		2005	
		Mean	**SD**	**Mean**	**SD**	**Mean**	**SD**	**Mean**	**SD**	**Mean**	**SD**
High	Non CSR	672.3	17.6	672.0	17.6	671.8	16.6	671.3	17.7	671.5	17.6
	CSR 2+yrs	673.9	12.3	672.4	11.4	673.1	11.8	673.5	12.2	673.4	12.1
Low	Non CSR	676.3	12.3	676.8	10.7	677.2	11.8	677.7	12.0	678.8	11.6
	CSR 2+yrs	677.0	7.3	675.5	10.5	667.4	11.7	675.4	3.5	671.7	6.2

Table 10.2

Results for the Test of Significance of Within and Between-Subjects When Schools are Categorized by Enrollment Levels

Source	Sum of Squares	Df	Mean Square	F	Sig.
Tests of Between-Subjects Effects					
Intercept	129862483.0	1	129862483.0	142816.56	0.00
Enroll	582.1	1	582.1	0.64	0.42
CSR Category	108.1	1	108.1	0.12	0.73
Enroll * CSR Category	526.3	1	526.3	0.58	0.45
Error	467378.0	514	909.3		
Tests of Within-Subjects Effects					
Year	208.1	4	52.0	0.81	0.52
Year * Enroll	176.8	4	44.2	0.69	0.60
Year * CSR Category	272.6	4	68.1	1.06	0.38
Year * Enroll * CSR Category	281.2	4	70.3	1.09	0.36
Error(Year)	132649.2	2056	64.5		

As evident from Table 10.2 above neither the within-subject effects nor between-subject effects were significant. This means that differences in enrollment did not imply any differences in performance levels. In fact, there were no differences even if within a particular enrollment category schools were separated by their participation levels in CSR. Hence, no graphs were provided.

Dependent Variable: Mean MAP Score/School Category: Free and Reduced Lunch Percentage

Table 11.1

Means and Standard Deviations of Mean MAP Scores for Different Categories of Percent Free and Reduced and CSR Participation Levels

% Free & Reduced	CSR Category	2001		2002		2003		2004		2005	
		Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
High	Non CSR	667.8	17.2	668.8	17.6	668.8	16.8	668.4	18.1	669.2	18.0
	CSR 2+yrs	673.3	12.7	670.8	12.6	668.8	12.9	672.9	12.1	671.8	12.6
Low	Non CSR	679.8	10.1	678.9	9.5	679.1	10.0	679.5	9.7	679.0	10.0
	CSR 2+yrs	677.3	6.7	677.3	6.4	677.7	7.6	675.5	6.8	675.1	6.3

Table 11.2

Results for the Test of Significance of Within and Between-Subjects When Schools are Categorized by Percent Free and Reduced Levels

Source	Sum of Squares	Df	Mean Square	F	Sig.
Tests of Between-Subjects Effects					
Intercept	180474617.4	1	180474617.4	255012.10	0.00
CSR Category	1.3	1	1.3	0.00	0.97
F/R	6174.4	1	6174.4	8.72	0.00
CSR Category * F/R	765.5	1	765.5	1.08	0.30
Error	424626.0	600	707.7		
Tests of Within-Subjects Effects					
Year	41.9	4	10.5	0.17	0.95
Year * CSR Category	62.8	4	15.7	0.26	0.91
Year * F/R	122.9	4	30.7	0.50	0.73
Year * CSR Category * F/R	180.7	4	45.2	0.74	0.56
Error(Year)	146401.6	2400	61.0		

From Table 11.2 above it is evident that the only significant factor was the percentage of Free and Reduced (F/R) category in the between-subjects effects. The graph below depicts the results.

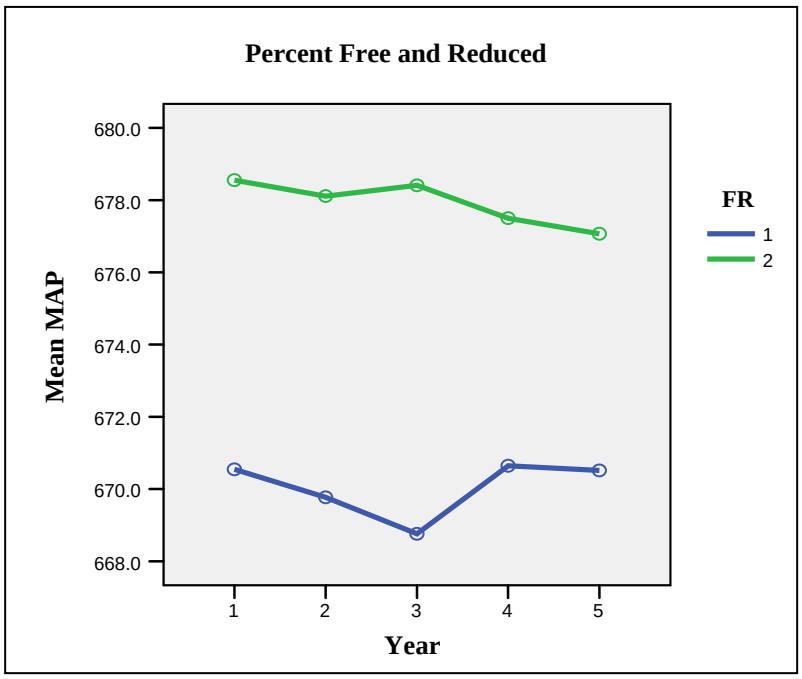

Figure 11.1.1. Year * Mean MAP * F/R Category

As evident in Figure 11.1.1, High F/R schools performed consistently below Low F/R schools. In year 1, they performed about 8 points below the Low F/R schools. By year 5 the High F/R schools still performed approximately 7 points below Low F/R schools. During the period of the study Low F/R mean MAP scores decreased and by year 5, they performed 2 points less than their year 1 score.

Dependent Variable: Mean MAP Score/School Category: Per Pupil Expenditure

Table 12.1

Means and Standard Deviations of Mean MAP Scores for Different Categories of Per Pupil Expenditure and CSR Participation Levels

PPE	CSR Category	2001		2002		2003		2004		2005	
		Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
High	Non CSR	669.4	19.8	669.6	18.9	668.6	19.6	668.2	20.0	669.0	21.1
	CSR 2+yrs	659.7	29.0	662.1	31.0	654.4	22.8	656.3	25.6	654.9	25.7
Medium	Non CSR	677.4	11.7	677.0	12.9	677.5	11.0	677.9	12.2	677.9	10.7
	CSR 2+yrs	677.8	5.7	674.1	9.1	675.9	10.1	676.7	5.1	675.8	5.9
Low	Non CSR	675.7	10.0	675.9	8.4	675.8	8.0	675.5	9.4	675.7	9.5
	CSR 2+yrs	672.8	10.1	676.3	5.1	670.5	7.0	673.5	8.2	673.2	8.3

Table 12.2

Results for the Test of Significance of Within and Between-Subjects When Schools are Categorized by Per Pupil Expenditure Levels

Source	Sum of Squares	df	Mean Square	F	Sig.
Tests of Between-Subjects Effects					
Intercept	101317172.2	1	101317172.2	134883.99	0.00
CSR Category	1478.5	1	1478.5	1.97	0.16
PPE	6212.1	2	3106.1	4.14	0.02
CSR Category * PPE	849.3	2	424.7	0.57	0.57
Error	415382.1	553	751.1		
Tests of Within-Subjects Effects					
Year	121.8	4	30.4	0.50	0.74
Year * CSR Category	105.2	4	26.3	0.43	0.79
Year * PPE	259.4	8	32.4	0.53	0.83
Year * CSR Category * PPE	150.4	8	18.8	0.31	0.96
Error(Year)	135112.2	2212	61.1		

As evident from Table 12.2 only **PPE** in the between-subjects effects was significant. In other words, schools in different PPE categories performed significantly different from each other.

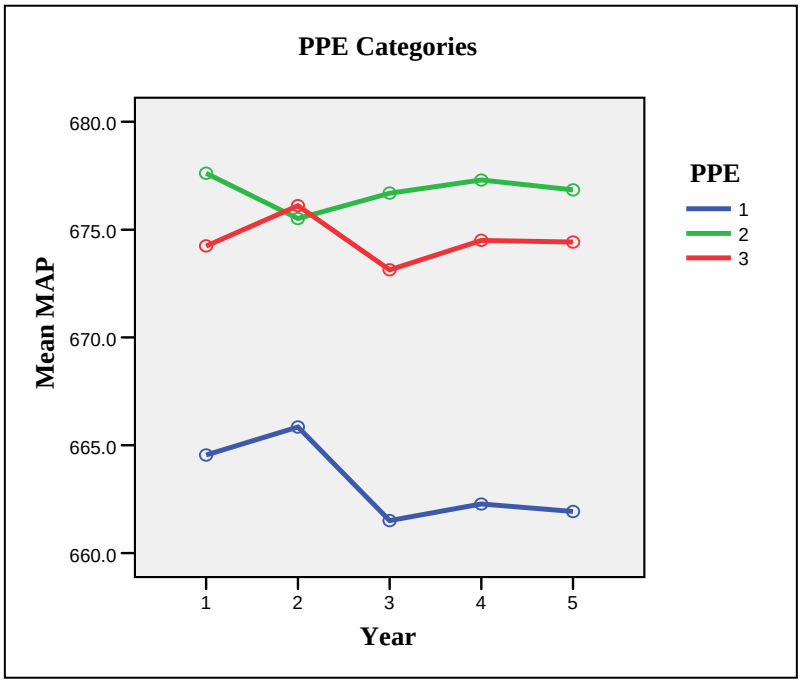

Figure 12.1.1. Year * Mean MAP * PPE Category

From Figure 12.1.1 it is evident that High PPE schools performed substantially lower throughout the 5 years of this study. In fact, the performance of High PPE schools dropped nearly 3 points over the 5-year period.

Medium PPE schools performed substantially higher than the High PPE schools during all the 5 years. In year 2 the performance of Medium PPE schools decreased to the level of the best performing Low PPE schools. By year 5, Medium PPE schools performed slightly below their year 1 level.

Low PPE schools performed consistently better than the High PPE category in all the 5 years of the study. Their performance increased in year 2, but dropped in year 3. Schools in this category performed slightly below Medium PPE schools, but about 12 points better than the High PPE schools throughout the 5 years of this study.

Seventh Grade Reading Report

Percent at Satisfactory and Above in Reading

The Comprehensive School Reform (CSR) grant was implemented in the middle school; hence, seventh grade Reading was examined.

The dependent variable for the Seventh Grade Report section was the percentage of students performing at satisfactory and above on the reading portion of the MAP. As mentioned previously, the dependent variable was considered through the three independent variables of Enrollment, F/R Lunch and PPE.

Dependent variable: Percent Students Performing at Satisfactory and Above in Reading/ School Category: Enrollment

Table 13.1

Means and Standard Deviations of Mean MAP Scores for Different Categories of Enrollment and CSR Participation Levels

Enrollment	CSR Category	2001		2002		2003		2004		2005	
		Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
High	Non CSR	59.7	19.4	61.3	19.5	58.5	18.9	57.7	20.3	60.1	19.8
	CSR 2+yrs	63.5	12.3	63.2	14.8	57.7	14.5	59.3	15.9	61.9	15.1
Low	Non CSR	65.0	17.8	67.4	15.4	65.1	15.2	64.1	16.9	69.8	15.8
	CSR 2+yrs	65.7	12.6	64.1	12.1	51.4	14.9	64.0	8.8	58.0	6.4

Table 13.2

Results for the Test of Significance of Within and Between-Subjects When Schools are Categorized by Enrollment Levels

Source	Sum of Squares	Df	Mean Square	F	Sig.
Tests of Between-Subjects Effects					
Intercept	1094548.1	1	1094548.1	939.20	0.00
Enroll	717.0	1	717.0	0.62	0.43
CSR Category	285.5	1	285.5	0.24	0.62
Enroll * CSR Category	952.0	1	952.0	0.82	0.37
Error	599017.3	514	1165.4		
Tests of Within-Subjects Effects					
Year	1243.4	4	310.9	2.53	0.04
Year * Enroll	215.9	4	54.0	0.44	0.78
Year * CSR Category	908.9	4	227.2	1.85	0.12
Year * Enroll * CSR Category	443.7	4	110.9	0.90	0.46
Error(Year)	252406.3	2056	122.8		

As presented in summary Table 13.2, the results of the univariate analyses of variance (ANOVA) of the means obtained on scores on CSR participation in relation to enrollment neither the between-subjects effects nor the within-subjects tests yielded significant results for enrollment.

Therefore, when schools are categorized by enrollment there were no significant differences in their performances levels. In fact, schools separated by their participation levels in the CSR grant over the years of the study did not yield different results. Hence, no graphs were analyzed.

Dependent variable: Percent of Students Performing at Satisfactory and Above in Reading/School Category: Free and Reduced Lunch Percentage

Table 14.1

Means and Standard Deviations of Mean MAP Scores for Different Categories of Percent Free and Reduced and CSR Participation Levels

% Free & Reduced	CSR Category	2001		2002		2003		2004		2005	
		Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
High	Non CSR	55.1	20.4	58.0	19.9	54.9	19.2	54.1	21.6	58.7	21.6
	CSR 2+yrs	60.2	13.1	61.2	15.6	52.6	16.5	60.5	15.7	59.6	15.8
Low	Non CSR	68.4	12.9	69.4	12.9	67.4	13.0	66.9	12.6	68.8	12.6
	CSR 2+yrs	69.0	6.8	67.8	9.7	64.8	9.4	62.8	11.8	66.0	9.3

Table 14.2

Results for the Test of Significance of Within and Between-Subjects When Schools are Categorized by Percent Free and Reduced Levels

Source	Sum of Squares	Df	Mean Square	F	Sig.
Tests of Between-Subjects Effects					
Intercept	1542458.5	1	1542458.5	1665.88	0.00
CSR Category	7.5	1	7.5	0.01	0.93
F/R	9237.6	1	9237.6	9.98	0.00
CSR Category * F/R	567.6	1	567.6	0.61	0.43
Error	555547.8	600	925.9		
Tests of Within-Subjects Effects					
Year	956.2	4	239.1	2.06	0.08
Year * CSR Category	335.6	4	83.9	0.72	0.58
Year * F/R	318.6	4	79.7	0.69	0.60
Year * CSR Category * F/R	263.0	4	65.7	0.57	0.69
Error(Year)	278673.7	2400	116.1		

As evident from Table 14.2, only the **F/R** in between-subjects test was significant. In other words, schools in different F/R categories performed significantly different than each other. The following graph depicts the results.

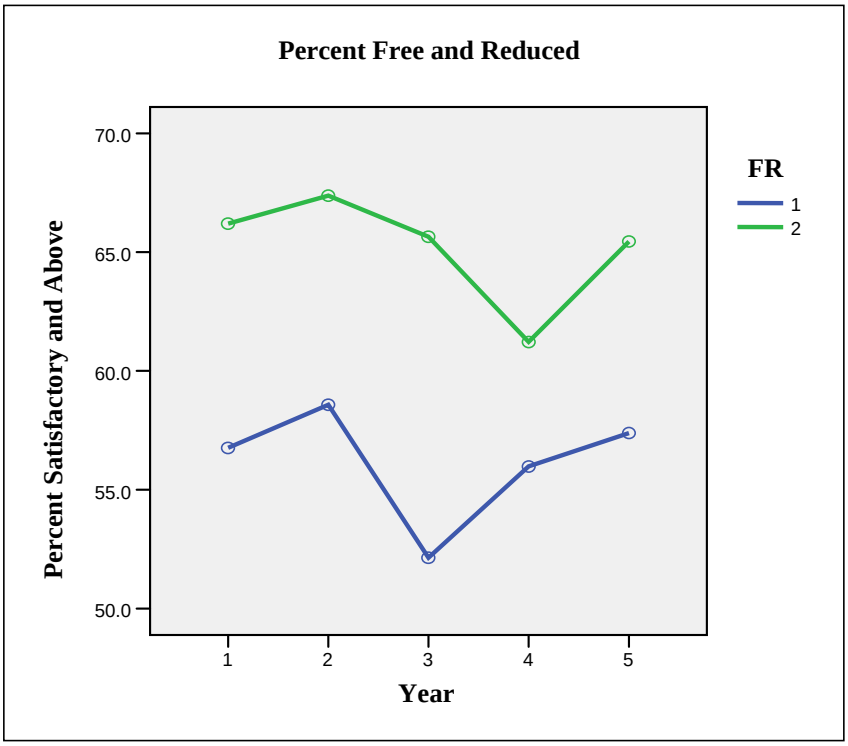

Figure 14.1.1. Year * Percent Satisfactory and Above * F/R Category

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As evident in Figure 14.1.1 High F/R schools had noticeably smaller percentages of students performing satisfactory and above in the Reading component of MAP than Low F/R schools in all the 5 years. In year 3, there was a substantial decrease in the percentage in High F/R schools, but the scores quickly improved through year 5 to reach their year 1 level. Nevertheless, High F/R schools performed 8 percentage points less than Low F/R schools in year 5.

Over the 5-year period Low F/R schools performed about 10 percent better than High F/R schools.

Dependent variable: Percent of Students Performing at Satisfactory and Above in Reading/School Category: Per Pupil Expenditure

Table 15.1

Means and Standard Deviations of Mean MAP Scores for Different Categories of Per Pupil Expenditure and CSR Participation Levels

PPE	CSR Category	2001		2002		2003		2004		2005	
		Mean	**SD**	**Mean**	**SD**	**Mean**	**SD**	**Mean**	**SD**	**Mean**	**SD**
High	Non CSR	57.2	24.2	59.4	23.3	54.6	22.8	53.2	24.3	58.1	24.8
	CSR 2+yrs	47.5	24.8	43.2	28.4	33.9	25.6	44.8	35.6	39.2	31.0
Medium	Non CSR	65.2	15.0	67.3	14.5	65.7	13.8	64.8	15.5	67.9	13.8
	CSR 2+yrs	66.4	8.6	65.4	11.5	62.1	13.6	65.0	9.4	66.5	9.1
Low	Non CSR	64.2	12.0	65.2	12.3	63.0	10.5	62.8	11.3	65.2	11.7
	CSR 2+yrs	62.1	10.8	68.8	9.1	55.6	8.4	60.3	12.5	62.2	10.3

Table 15.2

Results for the Test of Significance of Within and Between-Subjects When Schools are Categorized by Per Pupil Expenditure Levels

Source	Sum of Squares	Df	Mean Square	F	Sig.
Tests of Between-Subjects Effects					
Intercept	787843.6	1	787843.6	781.85	0.00
CSR Category	2061.0	1	2061.0	2.05	0.15
PPE	9208.3	2	4604.2	4.57	0.01
CSR Category * PPE	1599.0	2	799.5	0.79	0.45
Error	557242.3	553	1007.7		
Tests of Within-Subjects Effects					
Year	860.8	4	215.2	1.82	0.12
Year * CSR Category	422.0	4	105.5	0.89	0.47
Year * PPE	360.3	8	45.0	0.38	0.93
Year * CSR Category * PPE	329.7	8	41.2	0.35	0.95
Error(Year)	262095.3	2212	118.5		

As evident in Table 15.2 only the **PPE** in between-subjects test was significant. Schools in different PPE categories performed significantly different from each other. Therefore, the graph of PPE categories was provided.

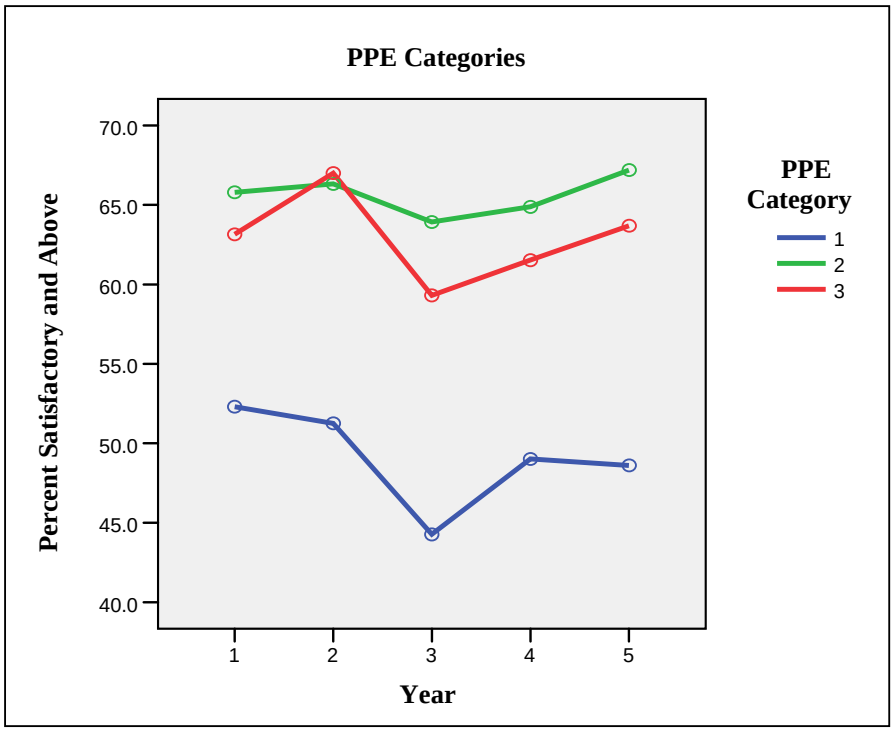

Figure 15.1.1. Year * Percent Satisfactory and Above * PPE Category

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As can be seen in Figure 15.1.1 High PPE schools had the lowest percentage of students at satisfactory and above compared to other PPE categories over the 5-year period of the study. In years 2 and 3, the percentage of students scoring at satisfactory and above decreased, but slightly increased in year 4. By the end of the 5-year period High PPE schools performed nearly 3 percent below their year 1 level and performed at least 16 percentage points below the other PPE categories.

Medium PPE schools outperformed the other PPE category schools in all 5 years. The percentage of students performing at satisfactory and above decreased in year 3, but improved in year 4 and 5 to finish slightly above their year 1 level.

Low PPE schools performed slightly lower than the Medium PPE schools with the exception of year 2 where the percentage of students at satisfactory and above

exceeded Medium PPE schools. The percentage dropped in year 3, but by the end of the 5-year period they performed at the same level as their year 1 percentage.

Eighth Grade Report

The Comprehensive School Reform (CSR) grant was implemented in the middle school; hence, eighth grade Mathematics was examined.

The dependent variable for the Eighth Grade Report section was the mean MAP score which was considered through the three independent variables of Enrollment, F/R Lunch and PPE. Schools that had an enrollment greater than 796 were classified as High Enrollment schools and those that had an enrollment less than 494 were classified as Low Enrollment schools. The distribution for enrollment was 350 High Enrollment schools (High = 350), 213 Low Enrollment schools (Low = 213), while 97 school buildings were excluded from the study. The free and reduced variable had a mean average of 47.29 with a standard deviation of 21.64. Schools with a F/R percentage less than 46.92 were classified as Low F/R and schools with a F/R percentage greater than 47.67 were classified as High F/R. Based on the distribution of F/R schools, there were 296 schools identified as High free and reduced (High F/R = 296), 344 identified as Low free and reduced (Low F/R = 344) and 20 schools excluded from the category. In the area of PPE, schools with expenditures greater than or equal to $7,164.90 were categorized as High PPE schools, schools with expenditures between $5,911.70 and $7,055.40 were categorized as Medium PPE, and schools with expenditures less than or equal to $5,802.30 were categorized as Low PPE schools. The distribution group for PPE resulted

in 111 High PPE schools (H = 111), 229 Medium PPE schools (M = 229), and 134 Low PPE schools (L = 134), while 48 school buildings were excluded from the analysis.

Dependent variable: Mean MAP Score/School Category: Enrollment

Table 16.1

Means and Standard Deviations of Mean MAP Scores for Different Categories of Enrollment and CSR Participation Levels

Enroll	CSR Category	2001		2002		2003		2004		2005	
		Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
High	Non CSR	695.5	21.0	695.3	21.0	697.3	23.5	699.1	20.8	700.2	20.6
	CSR 2+yrs	699.5	13.4	697.8	15.5	702.8	13.9	702.9	15.3	703.5	10.3
Low	Non CSR	701.6	16.1	703.0	17.2	705.9	14.3	704.2	16.5	706.2	15.7
	CSR 2+yrs	702.9	7.2	708.1	13.9	701.6	10.4	704.8	7.9	702.5	11.8

Table 16.2

Results for the Test of Significance of Within and Between-Subjects When Schools are Categorized by Enrollment Levels

Source	Sum of Squares	Df	Mean Square	F	Sig.
Tests of Between-Subjects Effects					
Intercept	143256648.6	1	143256648.6	101007.58	0.00
Enroll	1601.0	1	1601.0	1.13	0.29
CSR Category	237.8	1	237.8	0.17	0.68
Enroll * CSR Category	292.1	1	292.1	0.21	0.65
Error	733248.8	517	1418.3		
Tests of Within-Subjects Effects					
Year	394.9	4	98.7	0.91	0.46
Year * Enroll	369.3	4	92.3	0.85	0.49
Year * CSR Category	151.0	4	37.7	0.35	0.85
Year * Enroll * CSR Category	323.7	4	80.9	0.75	0.56
Error(Year)	223778.7	2068	108.2		

As evident from Table 16.2, none of the within- or between-subject effects were significant. When examining the yearly data from schools of different enrollment levels with different participation levels in CSR, the data revealed that there were no significant differences in levels of performance. Even looking at the cumulative score over the 5-year period did not show that schools performed significantly different when they were categorized by enrollment levels. Therefore, there are no graphs for this category.

Dependent variable: Mean MAP Score/School Category: Free and Reduced Lunch Percentage

Table 17.1

Means and Standard Deviations of Mean MAP Scores for Different Categories of Percent Free and Reduced and CSR Participation Levels

% Free & Reduced	CSR Category	2001		2002		2003		2004		2005	
		Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
High	Non CSR	690.6	20.4	691.2	21.7	693.7	24.0	694.4	20.5	696.3	20.5
	CSR 2+yrs	697.9	15.2	697.9	18.9	700.0	14.8	701.2	15.0	700.5	11.7
Low	Non CSR	705.1	13.9	705.3	13.3	707.4	12.2	707.1	14.4	708.6	13.4
	CSR 2+yrs	703.7	4.5	702.5	8.8	705.3	8.7	707.3	9.9	707.0	7.8

Table 17.2

Results for the Test of Significance of Within and Between-Subjects When Schools are Categorized by Percent Free and Reduced Levels

Source	Sum of Squares	Df	Mean Square	F	Sig.
Tests of Between-Subjects Effects					
Intercept	195225599.0	1	195225599.0	176212.71	0.00
CSR Category	544.2	1	544.2	0.49	0.48
F/R	9079.9	1	9079.9	8.20	0.00
CSR Category * F/R	1513.6	1	1513.6	1.37	0.24
Error	655875.2	592	1107.9		
Tests of Within-Subjects Effects					
Year	1033.5	4	258.4	2.52	0.04
Year * CSR Category	60.8	4	15.2	0.15	0.96
Year * F/R	7.2	4	1.8	0.02	1.00
Year * CSR Category * F/R	47.8	4	11.9	0.12	0.98
Error(Year)	242855.7	2368	102.6		

As evident from Table 17.2 only **F/R** in the between-subjects effects test was significant. Over the 5-year period of this study, schools in different F/R categories performed significantly different. The graph below plots the mean MAP scores determined by the percentage of students on Free and Reduced Lunch.

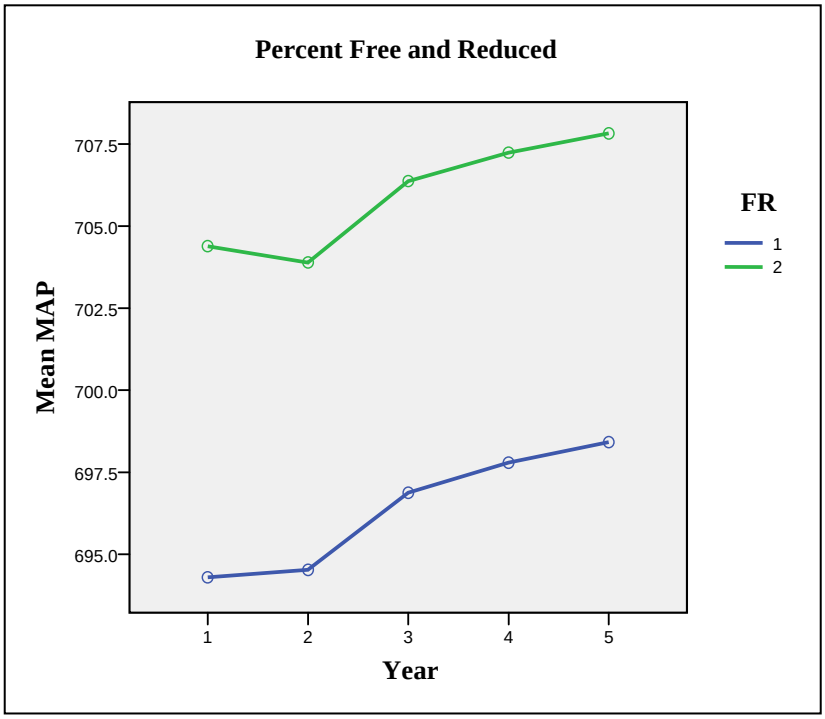

Fig 17.1.1. Year * Mean MAP * F/R Category

As evident from Figure 17.1.1 High F/R schools performed nearly 10 percentage points less than Low F/R schools throughout the study. During the same 5-year period there was a slight improvement in the performance levels of both the categories.

Dependent variable: Mean MAP Score/School Category: Per Pupil Expenditure

Table 18.1

Means and Standard Deviations of Mean MAP Scores for Different Categories of Per Pupil Expenditure and CSR Participation Levels

PPE	CSR Category	2001		2002		2003		2004		2005	
		Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
High	Non CSR	692.7	24.5	693.7	25.7	692.9	26.7	693.8	24.0	697.1	23.8
	CSR 2+yrs	688.9	34.9	679.3	34.9	681.0	18.0	679.7	19.9	696.0	6.5
Medium	Non CSR	701.6	15.8	701.7	15.8	705.4	13.9	704.9	14.8	705.5	14.4
	CSR 2+yrs	702.7	6.1	699.9	9.8	704.0	10.4	704.9	9.0	702.2	8.6
Low	Non CSR	700.6	11.2	700.1	11.7	703.3	11.8	703.3	11.3	706.1	11.3
	CSR 2+yrs	696.3	14.3	702.7	20.5	705.2	11.4	705.2	14.4	707.0	15.8

Table 18.2

Results for the Test of Significance of Within and Between-Subjects When Schools are Categorized by Per Pupil Expenditure Levels

Source	Sum of Squares	df	Mean Square	F	Sig.
Tests of Between-Subjects Effects					
Intercept	110549161.9	1	110549161.9	94451.76	0.00
CSR_Category	576.8	1	576.8	0.49	0.48
PPE	6663.1	2	3331.6	2.85	0.06
CSR_Category * PPE	676.0	2	338.0	0.29	0.75
Error	650759.0	556	1170.4		
Tests of Within-Subjects Effects					
Year	977.8	4	244.5	2.40	0.05
Year * CSR_Category	90.8	4	22.7	0.22	0.93
Year * PPE	839.3	8	104.9	1.03	0.41
Year * CSR_Category * PPE	573.4	8	71.7	0.70	0.69
Error(Year)	226929.4	2224	102.0		

As can be seen from Table 18.2, there were no significant within-subject or between-subject effects identified when schools were categorized by PPE. Schools in

different PPE categories with different levels of CSR participation levels did not perform significantly different when their data was analyzed by year. Moreover, even looking at the schools' performances over the 5 years did not indicate any significant differences. Because no significance was found, no graphs were analyzed.

HIGH SCHOOLS THAT WORK

Finally, the High Schools That Work (HSTW) grant was implemented in the high school; therefore, tenth grade Mathematics, eleventh grade Communication Arts and the ACT were examined.

The dependent variable for the HSTW section was the mean MAP score which was considered through the three independent variables of Enrollment, F/R Lunch and PPE.

Tenth Grade Report

The High Schools That Work (HSTW) grant was implemented in the high school; hence, tenth grade Mathematics was examined.

The dependent variable for the Tenth Grade Report section was the mean MAP score which was considered through the three independent variables of Enrollment, F/R Lunch and PPE. Schools that had an enrollment greater than 796 were classified as High Enrollment schools and those that had an enrollment less than 494 were classified as Low Enrollment schools. The distribution for enrollment was 296 High Enrollment schools (High = 296), 144 Low Enrollment schools (Low = 144), while 93 school buildings were excluded from the study. The free and reduced variable had a mean average of 38.78 with a standard deviation of 19.90. Schools with a F/R percentage less than 38.39 were classified as Low F/R and schools with a F/R percentage greater than 39.17 were classified as High F/R. Based on the distribution of F/R schools, there were 237 schools identified as High free and reduced (High F/R = 237), 291 identified as Low free and reduced (Low F/R = 291) and 5 schools excluded from the category. In the area of PPE, schools with expenditures greater than or equal to $7,164.90 were categorized as High

PPE schools, schools with expenditures between $5,911.70 and $7,055.40 were categorized as Medium PPE, and schools with expenditures less than or equal to $5,802.30 were categorized as Low PPE schools. The distribution group for PPE resulted in 111 High PPE schools (H = 111), 229 Medium PPE schools (M = 229), and 134 Low PPE schools (L = 134), while 48 school buildings were excluded from the analysis.

Dependent Variable: Mean MAP Score/School Category: Enrollment

Table 19.1

Mean and Standard Deviations of Mean MAP Scores for Different Categories of Enrollment and HSTW Participation Levels

Enrollment	HSTW Category	2001		2002		2003		2004		2005	
		Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
High	Non HSTW	725.3	26.0	722.8	24.5	725.8	25.9	729.3	26.3	730.3	26.9
	HSTW 1yr	737.9	10.0	732.2	9.7	734.9	7.4	738.3	9.0	740.2	9.2
	HSTW 2+yrs	732.0	13.7	725.4	12.0	736.9	18.0	734.8	17.3	739.1	20.2
Low	Non HSTW	733.0	16.2	731.5	15.5	734.6	14.3	736.8	16.1	735.9	14.9
	HSTW 1yr	729.6		755.4		737.0		727.2		719.1	

Table 19.2

Results for the Test of Significance of Within and Between-Subjects When Schools are Categorized by Enrollment Levels

Source	Sum of Squares	df	Mean Square	F	Sig.
Tests of Between-Subjects Effects					
Intercept	42951271.3	1	42951271.3	20078.13	0.00
HSTW_Category	590.4	2	295.2	0.14	0.87
Enroll	92.7	1	92.7	0.04	0.84
HSTW_Category * Enroll	501.5	1	501.5	0.23	0.63
Error	902745.4	422	2139.2		
Tests of Within-Subjects Effects					
Year	91.5	4	22.9	0.22	0.93
Year * HSTW_Category	1081.1	8	135.1	1.31	0.23
Year * Enroll	1128.4	4	282.1	2.74	0.03
Year * HSTW_Category * Enroll	876.4	4	219.1	2.13	0.08
Error(Year)	173936.6	1688	103.0		

As evident from Table 19.2, the two-way interaction in the within-subject effects **Year*Enrollment** was significant. The significance meant that in each year the schools in different enrollment categories performed significantly different. Therefore, the graph below was provided to signify the difference.

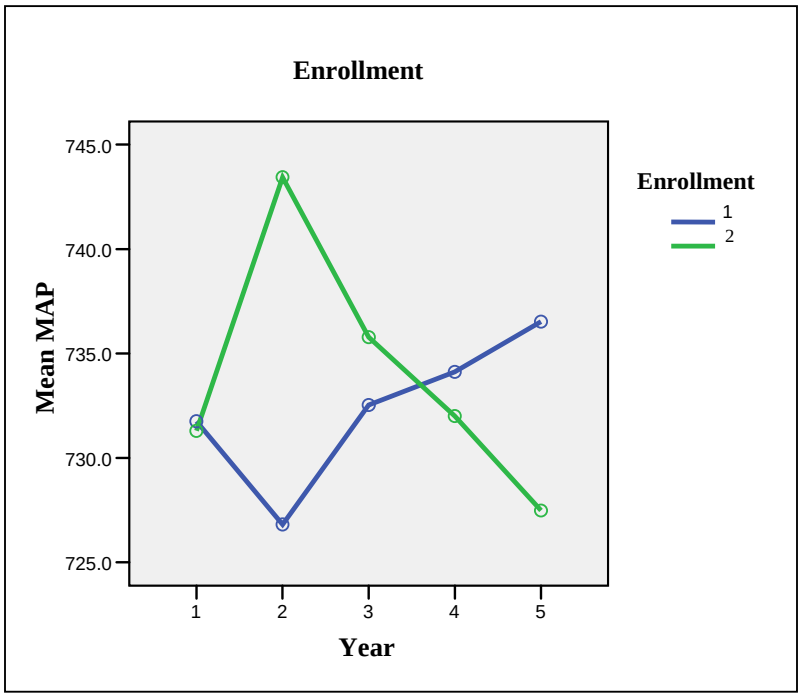

Figure 19.1.1. Year * Enrollment Category

In Figure 19.1.1 above, it is evident that the performance profile of High and Low Enrollment schools were different. In year 1, both High and Low Enrollment schools performed at the same level. After the initial year, the schools proceeded on completely different paths. The performance of High Enrollment schools dropped in year 2 but their performance improved each year and by year 5 these schools performed at least 5 points better than their year 1 level.

The performance of Low Enrollment schools performed almost the opposite of the High Enrollment schools. The Low Enrollment schools showed significant gains in year 2, but their performance dropped over the remaining period of the study. By the end of the 5-year period the mean MAP scores were about 4 points below their year 1 level and about 10 points below the High Enrollment level.

Dependent variable: Mean MAP Score/School Category: Free and Reduced Lunch Percentage

Table 20.1

Mean and Standard Deviations of Mean MAP Scores for Different Categories of Percent Free and Reduced and HSTW Participation Levels

% Free & Reduced	HSTW Category	2001		2002		2003		2004		2005	
		Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
High	Non HSTW	719.4	25.8	716.8	24.2	720.5	25.8	723.8	26.2	724.4	26.9
	HSTW 1yr	736.9	12.1	735.6	18.8	732.8	8.0	732.8	7.9	733.8	12.3
	HSTW 2+yrs	726.1	12.8	722.5	6.4	730.8	26.5	730.9	20.3	738.7	23.6
Low	Non HSTW	736.0	14.1	733.8	14.1	736.3	13.8	739.8	14.5	740.1	14.3
	HSTW 1yr	740.0	7.3	735.3	4.1	739.2	4.3	743.5	7.5	743.3	10.3
	HSTW 2+yrs	736.7	13.8	731.5	14.7	738.5	12.6	737.3	14.7	739.6	17.3

Table 20.2

Results for the Test of Significance of Within and Between-Subjects When Schools Categorized by Percent Free and Reduced Levels

Source	Sum of Squares	df	Mean Square	F	Sig.
Tests of Between-Subjects Effects					
Intercept	113702734.6	1	113702734.6	71779.46	0.00
HSTW_Category	3597.1	2	1798.6	1.14	0.32
F/R	4956.5	1	4956.5	3.13	0.08
HSTW_Category * F/R	2237.4	2	1118.7	0.71	0.49
Error	804700.8	508	1584.1		
Tests of Within-Subjects Effects					
Year	1283.3	4	320.8	3.12	0.01
Year * HSTW_Category	379.9	8	47.5	0.46	0.88
Year * F/R	45.9	4	11.5	0.11	0.98
Year * HSTW_Category * F/R	332.9	8	41.6	0.41	0.92
Error(Year)	208620.6	2032	102.7		

As evident from Table 20.2 above, none of the within- or between-subjects effects were significant. In other words, whether performance levels were analyzed each year or

overall all years, the performance levels pertaining to the different combinations of HSTW and F/R were not significantly different.

Dependent variable: Mean MAP Score/School Category: Per Pupil Expenditure

Table 21.1

Mean and Standard Deviations of Mean MAP Scores for Different Categories of Per Pupil Expenditure and HSTW Participation Levels

PPE	HSTW Category	2001		2002		2003		2004		2005	
		Mean	**SD**	**Mean**	**SD**	**Mean**	**SD**	**Mean**	**SD**	**Mean**	**SD**
High	Non HSTW	718.8	30.3	718.0	30.6	719.6	30.9	721.7	32.4	723.4	31.0
	HSTW 1yr	732.7	9.0	739.3	14.0	734.6	5.6	732.7	8.6	728.9	8.7
Medium	Non HSTW	732.9	17.0	731.2	15.4	733.8	14.8	737.7	13.9	737.0	15.8
	HSTW 1yr	734.2	1.8	733.7	2.1	736.4	0.8	742.3	12.3	742.4	12.9
	HSTW 2+yrs	732.0	11.7	724.4	10.6	737.1	21.7	732.7	18.3	738.2	21.3
Low	Non HSTW	733.8	13.2	728.6	13.4	733.2	11.6	735.9	14.6	738.6	12.0
	HSTW 1yr	741.7	12.1	732.0	14.7	734.9	10.3	737.8	9.3	742.3	10.2
	HSTW 2+yrs	720.7	19.0	724.9	13.6	726.2	19.7	731.2	8.8	728.0	15.4

Table 21.2

Results for the Test of Significance of Within and Between-Subjects When Schools are Categorized by Per Pupil Expenditure Levels

Source	Sum of Squares	Df	Mean Square	F	Sig.
Tests of Between-Subjects Effects					
Intercept	89828196.5	1	89828196.5	53567.13	0.00
HSTW_Category	2128.4	2	1064.2	0.63	0.53
PPE	3112.7	2	1556.3	0.93	0.40
HSTW_Category * PPE	1221.6	3	407.2	0.24	0.87
Error	781448.2	466	1676.9		
Tests of Within-Subjects Effects					
Year	641.2	4	160.3	1.57	0.18
Year * HSTW_Category	200.4	8	25.0	0.24	0.98
Year * PPE	585.6	8	73.2	0.72	0.68
Year * HSTW_Category * PPE	710.2	12	59.2	0.58	0.86
Error(Year)	190692.6	1864	102.3		

As evident in Table 21.2, none of the within- or between-subjects effects were significant. Whether mean MAP scores were examined each year or considered over the entire 5-year period of this study, there were no significant differences in the school's performance levels between different combinations of PPE and HSTW participation. Therefore, no graph was provided.

Eleventh Grade Report

The High Schools That Work (HSTW) grant was implemented in the high school; hence, eleventh grade Communication Arts was examined.

The dependent variable for the Eleventh Grade Report section was the mean MAP score which was considered through the three independent variables of Enrollment, F/R Lunch and PPE. Schools that had an enrollment greater than 796 were classified as High

Enrollment schools and those that had an enrollment less than 494 were classified as Low Enrollment schools. The distribution for enrollment was 292 High Enrollment schools (High = 292), 144 Low Enrollment schools (Low = 144), while 95 school buildings were excluded from the study. The free and reduced variable had a mean average of 38.47 with a standard deviation of 19.65. Schools with a F/R percentage less than 38.09 were classified as Low F/R and schools with a F/R percentage greater than 38.85 were classified as High F/R. Based on the distribution of F/R schools, there were 233 schools identified as High free and reduced (High F/R = 233), 291 identified as Low free and reduced (Low F/R = 291) and 7 schools excluded from the category. In the area of PPE, schools with expenditures greater than or equal to $7,164.90 were categorized as High PPE schools, schools with expenditures between $5,911.70 and $7,055.40 were categorized as Medium PPE, and schools with expenditures less than or equal to $5,802.30 were categorized as Low PPE schools. The distribution group for PPE resulted in 111 High PPE schools (H = 111), 229 Medium PPE schools (M = 229), and 134 Low PPE schools (L = 134), while 48 school buildings were excluded from the analysis.

Dependent variable: Mean MAP Score/School Category: Enrollment

Table 22.1

Mean and Standard Deviations of Mean MAP Scores for Different Categories of Enrollment and HSTW Participation Levels

Enrollment	HSTW_Category	2001		2002		2003		2004		2005	
		Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
High	Non HSTW	711.4	15.1	710.9	15.9	710.2	14.9	710.2	14.7	710.9	14.1
	HSTW 1yr	716.8	6.5	717.0	5.2	713.4	5.5	716.5	6.5	714.0	6.0
	HSTW 2+yrs	716.0	8.0	714.4	10.4	713.2	3.7	714.9	8.3	713.5	6.3
Low	Non HSTW	712.5	10.2	712.4	10.2	711.8	9.9	711.2	9.0	710.6	9.6
	HSTW 1yr	713.7	5.8	723.1	5.7	730.1	9.3	710.1	10.3	710.9	0.8

Table 22.2

Results for the Test of Significance of Within and Between-Subjects When Schools are Categorized by Enrollment Levels

Source	Sum of Squares	df	Mean Square	F	Sig.
Tests of Between-Subjects Effects					
Intercept	68199765.0	1	68199765.0	97762.18	0.00
HSTW_Category	1066.9	2	533.5	0.76	0.47
Enroll	70.8	1	70.8	0.10	0.75
HSTW_Category * Enroll	9.0	1	9.0	0.01	0.91
Error	290902.9	417	697.6		
Tests of Within-Subjects Effects					
Year	400.1	4	100.0	2.28	0.06
Year * HSTW_Category	411.3	8	51.4	1.17	0.31
Year * Enroll	610.7	4	152.7	3.48	0.01
Year * HSTW_Category * Enroll	506.4	4	126.6	2.89	0.02
Error(Year)	73195.2	1668	43.9		

As presented in Table 22.2, the results of the univariate analyses of variance (ANOVA) of the means obtained on the eleventh grade Communication Arts MAP scores

indicated that the three-way interaction **Year * HSTW * Enroll** was significant. This implied that schools with different enrollment levels with different levels of participation in HSTW performed significantly different each year. To examine the differences, graphs were provided below.

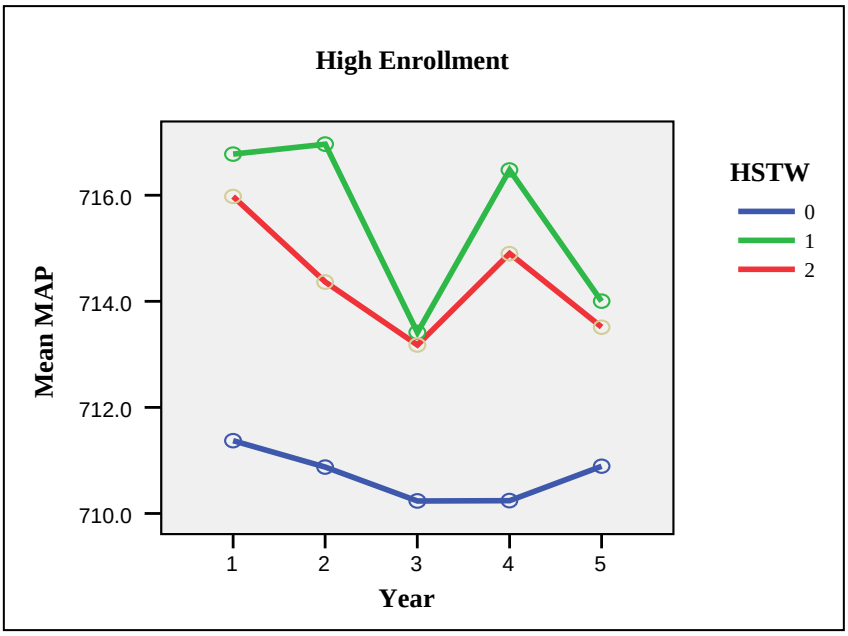

Figure 22.1.1. Year * High Enrollment * HSTW Category

Note the y axis scale is small

As indicated in Figure 22.1.1, the graph showed schools with High Enrollment levels in relation to the various HSTW categories. As evident from the graph, non HSTW (HSTW = 0) schools performed below the other HSTW levels in all the 5 years of this study. By the end of the study, HSTW = 0 schools performed slightly below the mean MAP score of year 1.

The schools that were in HSTW for only 1 year (HSTW = 1) during the entire 5-year period performed higher than schools in the other HSTW categories. In year 3 they performed about 3 mean MAP points lower than in year 2. By year 4, they had improved to their year 2 level. In year 5, their performance dropped approximately 3 points below their year 1 level. Even though they performed better than the other HSTW categories, their overall performance dropped nearly 5 mean MAP points throughout the 5 years of the study.

Schools that were in HSTW for 2+ years (HSTW = 2) during this study period performed similar to the HSTW = 1 schools. Like the HSTW = 1 schools, the overall performance of the HSTW = 2 schools decreased nearly 5 mean MAP points throughout the study.

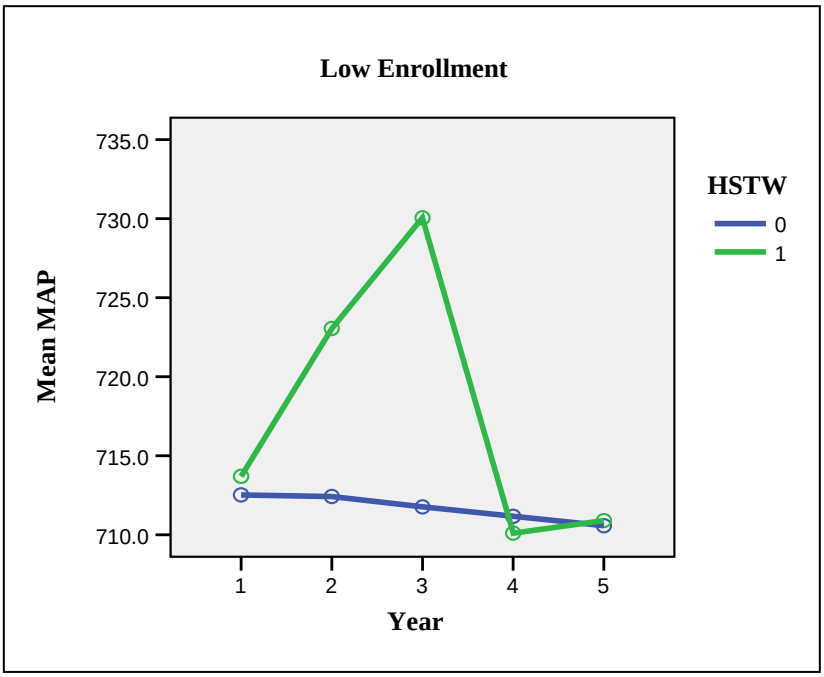

Figure 22.1.2. Year * Low Enrollment * HSTW Category

The graph on Figure 22.1.2 illustrates Low Enrollment schools. As can be seen from the graph there is no profile for HSTW 2+ years. During the 5-year period of the study, there were no Low Enrollment schools that had been in HSTW for 2 or more years.

As portrayed on the graph HSTW = 0 schools performed lower than the HSTW = 1 schools in the years 1, 2, and 3. Overall, their performance decreased each year and by the end of the study performed barely below their year 1 level.

The HSTW = 1 schools started off at the same level as HSTW = 0 schools, but experienced substantial improvements in years 2 and 3. By year 3 they performed about 15 points better than their year 1 level. However, in year 4 their performance dropped by nearly 21 mean MAP points to finish 3 points below their year 1 level. By the end of the 5-year period, HSTW = 1 schools performed at the same level as those schools that did not participate in HSTW.

Dependent variable: Mean MAP Score/School Category: Free and Reduced Lunch Percentage

Table 23.1

Mean and Standard Deviations of Mean MAP Scores for Different Categories of Free and Reduced and HSTW Participation Levels

Free & Reduced	HSTW Category	2001		2002		2003		2004		2005	
		Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
High	Non HSTW	707.2	14.4	706.5	15.0	705.6	15.0	706.3	13.9	706.0	13.5
	HSTW 1yr	716.3	4.0	714.5	5.6	717.8	11.5	716.1	7.6	711.1	4.8
	HSTW 2+yrs	715.0	9.2	712.3	8.3	708.1	7.1	706.5	16.8	708.6	8.0
Low	Non HSTW	715.8	9.9	715.7	10.2	714.7	9.3	714.1	9.5	714.8	8.9
	HSTW 1yr	714.7	8.3	720.8	4.7	718.6	4.5	714.1	6.8	715.3	6.8
	HSTW 2+yrs	714.9	8.5	715.2	10.0	715.3	4.7	716.0	6.3	714.0	7.1

Table 23.2

Results for the Test of Significance of Within and Between-Subjects When Schools are Categorized by Free and Reduced Levels

Source	Sum of Squares	Df	Mean Square	F	Sig.
Tests of Between-Subjects Effects					
Intercept	119190977.8	1	119190977.8	228,184.15	0.00
HSTW_Category	1629.6	2	814.8	1.56	0.21
F/R	1494.1	1	1494.1	2.86	0.09
HSTW_Category * F/R	837.1	2	418.5	0.80	0.45
Error	262739.8	503	522.3		
Tests of Within-Subjects Effects					
Year	231.3	4	57.8	1.33	0.26
Year * HSTW_Category	227.3	8	28.4	0.65	0.73
Year * F/R	121.7	4	30.4	0.70	0.59
Year * HSTW_Category * F/R	273.5	8	34.2	0.79	0.61
Error(Year)	87345.4	2,012	43.4		

As evident from Table 23.2, none of the within- or between-subjects effects were significant. This means that irrespective of whether data was analyzed each year or over the entire 5-year period, schools with different F/R levels and with different participation levels in HSTW did not perform significantly different from each other. Therefore, no graph was necessary to examine.

Dependent variable: Mean MAP Score/School Category: Per Pupil Expenditure

Table 24.1

Mean and Standard Deviations of Mean MAP Scores for Different Categories of Per Pupil Expenditure and HSTW Participation Levels

PPE	HSTW Category	2001		2002		2003		2004		2005	
		Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
High	Non HSTW	705.8	18.7	705.0	20.1	705.5	17.5	704.5	18.0	704.6	18.0
	HSTW 1yr	715.1	5.9	716.4	9.3	720.8	10.9	713.3	6.6	711.6	5.0
Medium	Non HSTW	714.2	9.2	714.5	8.9	712.7	11.5	713.2	9.0	713.3	8.5
	HSTW 1yr	710.4	4.9	716.1	1.7	714.6	6.0	715.5	6.4	713.3	13.1
	HSTW 2+yrs	712.5	8.5	711.0	6.4	709.7	6.4	710.4	13.0	707.9	6.2
Low	Non HSTW	715.0	7.3	714.4	7.7	712.4	8.2	712.9	6.2	713.2	6.7
	HSTW 1yr	719.3	5.5	718.2	4.9	713.4	5.8	717.0	8.6	713.7	3.9
	HSTW 2+yrs	710.0	5.6	709.5	11.3	713.9	6.1	709.9	12.4	713.8	5.9

Table 24.2

Results for the Test of Significance of Within and Between-Subjects When Schools are Categorized by Per Pupil Expenditure Levels

Source	Sum of Squares	df	Mean Square	F	Sig.
Tests of Between-Subjects Effects					
Intercept	92828482.2	1	92828482.2	165343.61	0.00
PPE	977.8	2	488.9	0.87	0.42
HSTW_Category	955.8	2	477.9	0.85	0.43
PPE * HSTW_Category	982.9	3	327.6	0.58	0.63
Error	261063.9	465	561.4		
Tests of Within-Subjects Effects					
Year	84.0	4	21.0	0.48	0.75
Year * PPE	246.7	8	30.8	0.70	0.69
Year * HSTW_Category	152.1	8	19.0	0.43	0.90
Year * PPE * HSTW_Category	275.8	12	23.0	0.52	0.90
Error(Year)	81897.3	1860	44.0		

On examination of Table 23.2, none of the within- or between-subjects effects were significant. By looking at the data each year or at the entire 5-year period, there were no significantly different results for schools in different PPE levels with different HSTW participation levels. Due to not have any significant interactions, no graphs were necessary.

District Level Report - ACT

As stated earlier, the High Schools That Work (HSTW) grant was implemented in the high school; therefore, the American College Test (ACT) was examined. The ACT data was examined on a district level basis. ACT does not provide data to the district as to how tenth and eleventh graders, separately, do on the test. Therefore, the information used for the purpose of this study was the overall composite score for the ACT test.

The dependent variable for the HSTW section was the ACT Composite score which was considered through the three independent variables of Enrollment, F/R Lunch and PPE.

Schools that had an enrollment greater than 796 were classified as High Enrollment schools and those that had an enrollment less than 494 were classified as Low Enrollment schools. The distribution for enrollment was 262 High Enrollment schools (High = 262), 143 Low Enrollment schools (Low = 143), while 92 school buildings were excluded from the study. The free and reduced variable had a mean average of 36.88 with a standard deviation of 17.34. Schools with a F/R percentage less than 36.53 were classified as Low F/R and schools with a F/R percentage greater than 37.22 were classified as High F/R. Based on the distribution of F/R schools, there were 225 schools identified as High free and reduced (High F/R = 225), 263 identified as Low free and

reduced (Low F/R = 263) and 9 schools excluded from the category. Finally, when per pupil expenditure (PPE) was considered, schools with expenditures greater than or equal to $7,164.90 were categorized as High PPE schools, schools with expenditures between $5,911.70 and $7,055.40 were categorized as Medium PPE, and schools with expenditures less than or equal to $5,802.30 were categorized as Low PPE schools. The distribution group for PPE resulted in 111 High PPE schools (H = 111), 229 Medium PPE schools (M = 229), and 134 Low PPE schools (L = 134), while 48 school buildings were excluded from the analysis.

Dependent Variable: ACT Composite Score/School Category: Enrollment

Table 25.1

Mean and Standard Deviations of ACT Composite Scores for Different Categories of Enrollment and HSTW Participation Levels

Enrollment	HSTW	2001		2002		2003		2004		2005	
		Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
High	non HSTW	21.0	1.2	20.9	1.3	20.9	1.2	21.0	1.3	21.0	1.3
	HSTW 1yr	21.3	0.6	21.1	1.8	21.1	0.6	20.9	0.7	20.9	0.8
	HSTW 2+ yrs	20.5	0.9	21.0	1.0	20.4	1.4	20.3	0.7	21.1	0.8
Low	non HSTW	19.9	1.6	20.1	1.7	19.9	1.6	20.1	1.6	20.0	1.6
	HSTW 1yr	19.2	0.3	18.6	0.7	19.5	0.1	19.2	0.1	20.6	0.3
	HSTW 2+ yrs	21.1		19.5		17.7		21.0		19.1	

Table 25.2

Results for the Test of Significance of Within and Between-Subjects When Districts are Categorized by Enrollment Levels

Source	Sum of Squares	df	Mean Square	F	Sig.
Tests of Between-Subjects Effects					
Intercept	40674.4	1	40674.4	7331.19	0.00
Enroll	35.4	1	35.4	6.39	0.01
HSTW	3.6	2	1.8	0.32	0.72
Enroll * HSTW	3.3	2	1.7	0.30	0.74
Error	1836.4	331	5.5		
Tests of Within-Subjects Effects					
Year	4.6	4	1.1	1.07	0.37
Year * Enroll	4.4	4	1.1	1.02	0.40
Year * HSTW	9.1	8	1.1	1.07	0.38
Year * Enroll * HSTW	13.0	8	1.6	1.52	0.15
Error(year)	1417.4	1324	1.1		

As evident from Table 25.2 above only **Enrollment** in the between-subjects effects was significant. When considering the entire 5-year period of this study, districts with different enrollment levels performed significantly different. Therefore, the graph below was provided to illustrate the significance.

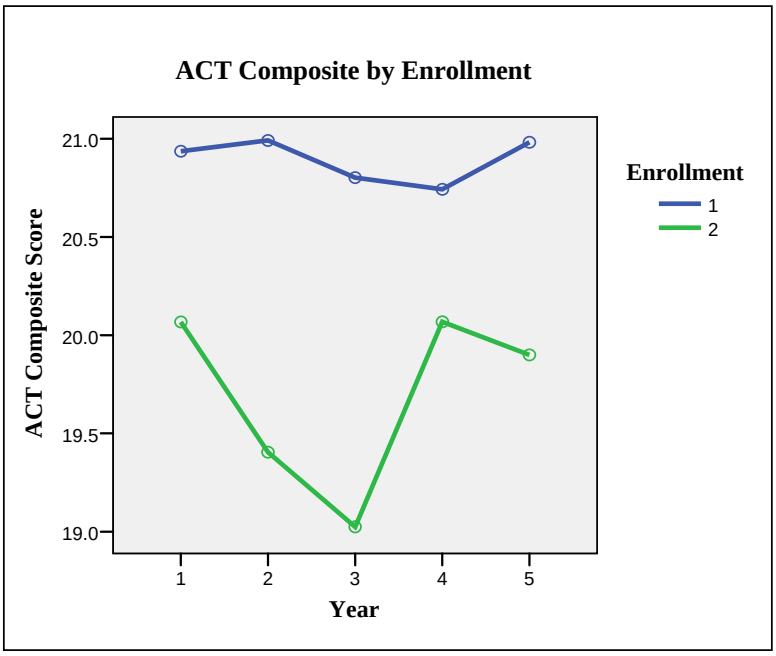

Figure 25.1.1. Year * ACT * Enrollment Category

Note: y axis scale is small

From above Figure 25.1.1, it was evident that High Enrollment schools performed better than Low Enrollment schools throughout the 5-year period of the study. High Enrollment schools performed near the same level in each of the 5 years.

As can be seen from the graph, the performance of Low Enrollment schools varied during the period of the study. During years 2 and 3, the composite score dropped one composite point below their year 1 level. In year 4 the performance increased by nearly the same level. By year 5, Low Enrollment schools performed near the same level as their year 1 level.

Overall, there was an average difference of about 0.75 composite points between High and Low Enrollment schools.

Dependent Variable: ACT Composite score/School Category: Free and Reduced Lunch Percentage

Table 26.1

Mean and Standard Deviations of ACT Composite Scores for Different Categories of Free and Reduced and HSTW Participation Levels

% Free & Reduced	HSTW	2001		2002		2003		2004		2005	
		Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
High	Non HSTW	20.0	1.6	20.0	1.6	19.9	1.4	19.9	1.5	19.9	1.6
	HSTW 1yr	20.2	1.2	20.0	2.5	20.1	1.0	20.0	1.0	20.6	0.3
	HSTW 2+ yrs	20.9	0.8	20.0	1.0	18.7	1.7	20.0	1.0	19.6	0.5
Low	Non HSTW	21.0	1.1	21.1	1.2	21.0	1.1	21.1	1.2	21.1	1.2
	HSTW 1yr	21.3	0.8	21.3	0.7	21.3	0.1	20.9	0.9	20.5	0.5
	HSTW 2+ yrs	20.6	0.9	20.8	1.0	20.7	0.8	20.6	0.7	21.2	0.7

Table 26.2

Results for the Test of Significance of Within and Between-Subjects When Districts are Categorized by Free and Reduced Levels

Source	Sum of Squares	df	Mean Square	F	Sig.
Tests of Between-Subjects Effects					
Intercept	77912.0	1	77912.0	16643.31	0.00
F/R	43.2	1	43.2	9.22	0.00
HSTW	2.1	2	1.0	0.22	0.80
F/R * HSTW	0.9	2	0.5	0.10	0.90
Error	1947.4	416	4.7		
Tests of Within-Subjects Effects					
Year	2.9	4	0.7	0.66	0.62
year * F/R	3.2	4	0.8	0.74	0.57
year * HSTW	5.0	8	0.6	0.57	0.80
year * F/R * HSTW	9.7	8	1.2	1.11	0.35
Error(year)	1819.3	1664	1.1		

Table 26.2 revealed that the **F/R** category in the between-subjects effects was significant. In other words, when looking at the districts' overall performances over the 5

years, those districts with a high percent of Free and Reduced lunch performed significantly different from Low Free and Reduced districts.

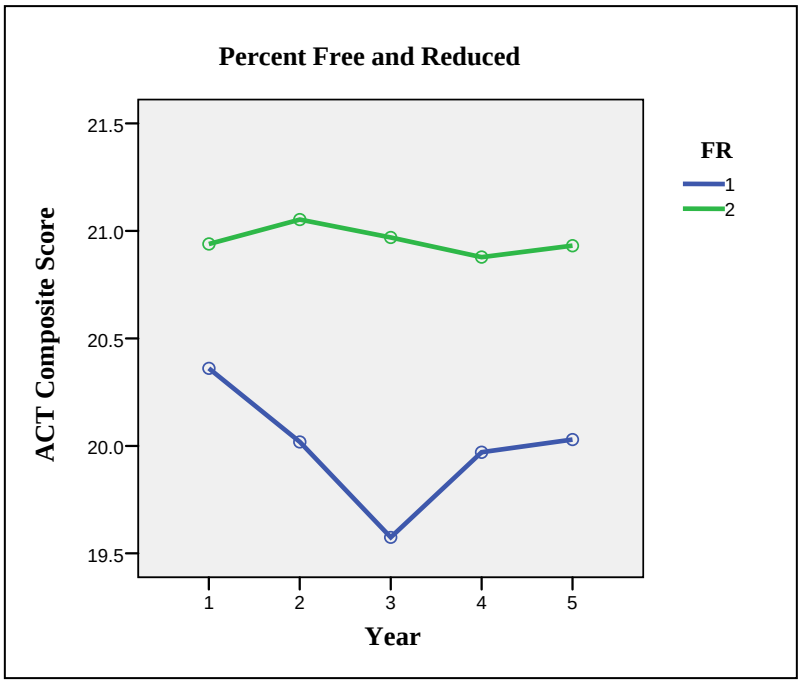

Figure 26.1.1. Year * ACT * F/R Category

From Figure 26.1.1, it was evident that High F/R districts performed substantially lower than Low F/R schools. The performance of High F/R districts dropped in years 2 and 3 with modest increases in years 4 and 5. Over the 5-year period their performance dropped nearly 0.5 composite points.

Low F/R districts performed near the same level throughout the 5 years with very slight fluctuations in years 2 and 4.

Overall, Low F/R districts performed substantially higher than High F/R districts and by year 5 performed nearly 1 composite point higher on the ACT.

Dependent Variable: ACT Composite Score/School Category: Per Pupil Expenditure

Table 27.1

Mean and Standard Deviations of ACT Composite Scores for Different Categories of Per Pupil Expenditure and HSTW Participation Levels

PPE	HSTW	2001		2002		2003		2004		2005	
		Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
High	Non HSTW	20.2	1.9	20.1	1.8	20.2	1.9	20.3	2.0	20.0	2.1
	HSTW 1yr	19.7	0.9	18.9	0.7	20.1	1.1	19.7	0.9	21.1	0.9
Medium	Non HSTW	20.5	1.3	20.5	1.5	20.4	1.3	20.5	1.4	20.5	1.3
	HSTW 1yr	21.3	0.1	20.6	2.2	20.7	1.0	21.3	1.1	20.8	0.6
	HSTW 2+ yrs	20.5	0.8	20.0	1.0	19.8	1.5	20.9	0.6	20.9	0.8
Low	Non HSTW	20.9	1.1	21.0	1.2	20.9	1.1	20.8	1.3	20.8	1.1
	HSTW 1yr	21.4	0.9	22.0	1.5	21.3	0.3	20.8	0.4	20.5	0.5
	HSTW 2+ yrs	20.7	0.9	21.0	0.9	20.3	1.4	20.2	0.8	20.7	1.1

Table 27.2

Results for the Test of Significance of Within and Between-Subjects When Districts are Categorized by Per Pupil Expenditure Levels

Source	Sum of Squares	Df	Mean Square	F	Sig.
Tests of Between-Subjects Effects					
Intercept	83674.9	1	83674.9	14315.15	0.00
PPE	29.7	2	14.9	2.54	0.08
HSTW	4.4	2	2.2	0.38	0.69
PPE * HSTW	4.1	3	1.4	0.23	0.87
Error	2227.0	381	5.8		
Tests of Within-Subjects Effects					
Year	2.2	4	0.5	0.50	0.74
year * PPE	16.5	8	2.1	1.87	0.06
year * HSTW	6.3	8	0.8	0.71	0.69
year * PPE * HSTW	14.9	12	1.2	1.12	0.34
Error(year)	1686.0	1524	1.1		

As evident from Table 27.2, none of the within- or between-subjects effects were significant. As stated before, whether the data was considered for each year or over the entire 5-year period, no significant differences in performance between districts with different participation levels in the HSTW program were determined. Therefore, no graph was provided for HSTW categories as determined by PPE.

Summary

The grants examined in this study were the Reading First (MORF), “enhancing Missouri's Instructional Networked Teaching Strategies” (eMINTS), Comprehensive School Improvement (CSR), and High Schools That Work (HSTW). Each of these grants had various components which required a sustained effort of professional development.

Chapter 4 discussed the data gathered from the 524 school districts in Missouri. The data included the mean MAP scores from Communication Arts in the third, seventh, and eleventh grades, and Mathematics in the fourth, eighth, and tenth grades. In addition, the percentage of students that performed satisfactory and above in Reading Proficiency was examined in the third and seventh grades, and the ACT composite scores were analyzed for student performance in the tenth and eleventh grades. The data gathered from the MAP and ACT was used to determine if there was any significant impact of sustained professional development programs on student achievement. The data was also examined in relation to enrollment size, the percentage of students who qualified for the free and reduced lunch program and per pupil expenditure.

The null hypothesis was rejected for both hypotheses. Based on the study, there were a number of areas which resulted in significant differences or interactions in

connection with student achievement. Data analyses performed on the MAP test scores revealed there were significant differences between those schools that implemented one or more of these reform grants, which required sustained professional development and schools that did not implement these grants.

The results indicated that grants which had a requirement of sustained professional development had a significant impact on selected areas of performance in selected school buildings. A more detailed summary and a discussion of the findings are presented in the next chapter.

CHAPTER 5

DISCUSSIONS AND CONCLUSIONS

Overview

From the 1950s until now, little research has been completed about the impact of professional development on student achievement. More specifically, research that links professional development to student outcomes has been evasive. As the research has evolved from the 1980s through today, politicians have become increasingly aware of the need for change in education and the need to provide qualified educators within the classroom setting. Because of legislative directives, reform programs have emerged in hopes of providing professional development for educators that have an impact on student achievement. Federal policymakers began to argue that state and federal policy should focus on outcomes, such as student achievement, rather than inputs (Finn, 1990). State policymakers soon began to adopt this same position, linking their funding to outcomes through an emphasis on accountability (Choy & Ross, 1998). From political pressure, reforms grants emerged focused on improvement of student achievement and grounded with a strong component of sustained, systematic professional development.

This study examined the four reform grants: the eMINTS program which started in 1999; the Comprehensive School Reform which began in 1998 and was an important component of the No Child Left Behind (NCLB) legislation; the High School That Works grant which was established by the Southern Regional Education Board in 1987; and the Reading First grant which was also a major component of NCLB, signed into law by President George W. Bush in 2002.

This study confirms a number of areas that resulted in significant differences contributed to student achievement. Data analysis performed on the MAP test scores revealed significant differences between schools that implemented one or more of these reform grants requiring sustained professional development and schools that did not implement any of these grants.

School buildings that implemented grants that required systematic professional development programs showed significant improvement in the mean MAP scores in certain grade levels where the MAP test was administered. This study also revealed areas where schools that implemented at least one of the selected grants did not experience significant impact on student achievement.

This chapter presents the major findings of the analysis of the data, draws conclusions about the impact of systematic professional development on selected areas of student performance in selected Missouri school buildings, and discusses recent developments that may affect future considerations of the professional development of reform grants.

Chapter 5 will summarize and discuss the results of this study to determine if the professional development in the selected reform grants had an impact on student performance. It will review the statement of the problem, the methodology used in this particular study, the limitations of the study, and, finally, a conclusion of the results.

Statement of the Problem

The primary purpose of this study was to determine what impact, if any, existed between select Missouri school districts that implement systematic professional

development programs and the improved achievement of their students. More specifically, this study focused on the academic areas of the MAP test including Mathematics, Communication Arts, Reading scores in the third and seventh grades, and ACT scores. In addition, the following research questions were addressed in the study to help obtain additional information:

1. What are the perceptions of the stakeholders on current staff development programs in schools?
2. What types of professional development activities appear to have the greatest impact on student achievement?
3. When implementing professional development programs, how do building enrollment size, building free and reduced lunch percentage, and district per pupil expenditure affect student achievement?

Currently, few studies have clearly been able to link the impact of the professional development initiatives to student achievement. Because of disparities in every district, research has been vague as to whether a sustained professional development program has had a direct impact on student achievement. In order to obtain data relative to the statement of the problem and the major questions, the following hypotheses were developed:

1. There will be no significant difference in student achievement in school buildings that implement funded systematic professional development programs for educators in the areas of mathematics, communication arts, third and seventh grade reading, and ACT scores than in those that have one or no funded projects.

2. There will be no significant difference in student achievement in buildings that implement multiple funded projects or grants that require sustained professional development than in those that have one or no funded projects.

Review of the Methodology

As explained in Chapter 3, the study reported here was a quantitative analysis of data gathered on all Missouri school buildings from the Department of Elementary and Secondary Education. MAP and ACT data were collected and used to compare schools that implemented at least one of the reform grants requiring a sustained professional development program to those schools that did not implement at least one.

This study relied exclusively on the average mean MAP scores for Communication Arts in the third, seventh and eleventh grades, percentage of students performing at satisfactory and above on Reading Proficiency on the third and seventh grade portions of the MAP test, Mathematics in the fourth, eleventh, and tenth grades, and the ACT test. In addition, the study relied on the enrollment size, free and reduced percentage on the National School Lunch Program, and per pupil expenditures of each district. This study was conducted to determine if the comprehensive professional development programs had an impact on increased student achievement.

Summary of the Findings

Currently, most professional development practices are limited, disjointed, and not significant. The difficulty of teaching and learning is mismatched with the narrow focus of the traditional professional development programs. There is a tremendous

amount of evidence about the significance of the connection between professional development, the quality of the professional development, and student achievement. However, as stated previously, research has been unable to definitively prove the connection. Effective professional development requires that ongoing investigation be entrenched in the daily life of the school.

Based on the data analysis in Chapter 4, there were a number of findings. This study analyzed the MAP and ACT data of schools from 2001 to 2005. The findings will be segregated by eMINTS and Reading First, Comprehensive School Reform, and then, High Schools That Work.

Reading First and eMINTS

Multiple Funded Projects – Third Grade

Data analysis indicated that Reading First had the greatest impact on student achievement. More precisely, Reading First schools showed significant gains in the third grade Communication Arts and Reading Proficiency portions of the MAP test after 2 years of participating in the grant. Mean MAP scores increased in all tested areas in the third grade. In non eMINTS schools, mean MAP scores in the schools participating in Reading First (RF 1) increased from 627 to almost 637, nearly a 10 point increase over the 5-year period. In schools where eMINTS had been implemented only one year and Reading First had been implemented 2 years, the mean MAP scores increased nearly 20 points from 629 to 649 during the period of the study.

Schools that had neither Reading First nor eMINTS performed nearly 13 points higher than either of the other two Reading First categories. However, after the five years

of the study, RF 0 schools had small gains while RF 2 schools had closed the gap within 5 points. Likewise, schools that were not Reading First schools and had participated in eMINTS for 1 year showed little gain over the study. However, RF 2 schools had substantial gains and by the end of the study were performing nearly 7 points higher than the RF 0 schools. Finally, schools that were not RF schools but had implemented eMINTS for 2 years, did not show any significant gains. Conversely, the other two Reading First categories, RF 1 and RF 2, actually decreased in scores and by the end of the 5-year period, had, in fact, lost ground on the RF 0 schools.

The Third Grade Reading Proficiency area of the MAP test showed similar gains. In non eMINTS schools, the percentage of students who scored satisfactory and above increased 13 percent from 57 percent to approximately 70 percent. In schools where eMINTS had been implemented for only one year and Reading First for 2 years, the percentage of students performing at satisfactory and above increased 10 percent, from 67 percent to 77 percent over the 5 years. When the Reading Proficiency portion of the MAP was analyzed, the findings mirrored Communication Arts.

The only area where Reading First showed decreases in MAP scores was when the schools had participated at least 2 years in the eMINTS program and 2 years in the Reading First program. Oddly enough, the mean MAP score in third grade Communication Arts dropped nearly 3 points from 636 to 633 over the 5-year period of the study. In the Reading Proficiency portion of the MAP, the percentage of students performing at satisfactory and above decreased by nearly 5 percent over the study.

In addition, Reading First in relation to third grade Communication Arts showed gains when independent variables were considered. High Enrollment schools tended to

show no significant changes in scores; however High Enrollment scores were about 10 points above all participation levels in Reading First. However, in Low Enrollment schools, buildings that had implemented the Reading First program posted gains in test scores. The mean MAP score in Communication Arts of RF 2 schools increased nearly 14 points, from 638 to 652 over the 5 years, and ended up performing nearly 10 points higher than schools that did not implement Reading First in both High and Low Enrollment schools. Low Enrollment schools in Reading First one year showed moderate gains, but still performed below non Reading First schools.

Another significant finding involved the per pupil expenditure (PPE) of school districts. Based on the analysis in Chapter 4, schools in different implementation years of eMINTS and in different implementation years of Reading First were affected by the different levels of PPE. However, Medium PPE schools that had implemented eMINTS for one year and had been in Reading First for two years showed a significant gain in mean MAP scores. Mean MAP scores for schools in this combination increased by approximately 40 points, from 635 to 674. Ironically, data also indicates that schools in the Medium PPE group and that had implemented Reading First for 2 years had significant gains in the percentage of students who performed at satisfactory and above on the Reading Proficiency portion of the MAP test. The percentage of students performing at satisfactory and above increased 16 percent, from 68 percent to 84 percent over the 5 years.

eMINTS – Third and Fourth Grades

Data for the eMINTS program was analyzed in the third and fourth grades. The MAP areas examined at these grade levels were third grade Communication Arts, third grade Reading Proficiency, and fourth grade Mathematics. The findings from this research indicated that eMINTS had no significant impact on mean MAP scores in the third or fourth grade and across any of the independent variables over the 5 years of the study. Starting with the data in 2000, non eMINTS schools that participated 1 year and schools that participated at least 2 years had mean MAP scores of 639, 638 and 639, respectively. By the end of the study through 2005, the mean MAP scores of the same groups were 643, 638, and 642, respectively. Likewise, when Reading Proficiency was analyzed in regards to the percentage of students performing at satisfactory and above, non eMINTS, eMINTS = 1, and eMINTS = 2 schools had 73 percent, 73 percent, and 74 percent, respectively. Over the five years of the study, non-eMINTS schools had 77 percent performing at proficiency, eMINTS = 1 had 73 percent and eMINTS = 2 had 76 percent.

The only significance noted on the fourth grade eMINTS data was the interaction with the eMINTS categories and the percentage of students that qualified for free and reduced lunch (F/R). Schools with a high number of F/R students and that participated in the eMINTS program for one year saw a 10 point gain in mean MAP scores on the MAP test. In addition, eMINTS = 1 schools performed better than the other eMINTS categories. However, High F/R schools still performed lower than the Low F/R schools.

Comprehensive School Reform

The Comprehensive School Reform (CSR) grant administered in the seventh and eighth grades demonstrated no significant gains on student achievement. Data analyzed from the MAP areas which consisted of seventh grade Communication Arts, seventh grade Reading Proficiency, eighth grade Mathematics indicated no evidence of impact on student achievement.

However, analysis of the independent variables noted significant differences. Schools that have High F/R Lunch performed substantially lower than schools with Low F/R Lunch. Also schools with a high PPE performed substantially lower than the other two PPE categories.

High Schools That Work

The High Schools That Work (HSTW) grant was administered in the tenth and eleventh grades. Data analyzed from the MAP test in the areas of tenth grade Mathematics, eleventh grade Communication Arts, and the ACT test resulted in significance on only the eleventh grade test. More specifically, there was a considerable difference in schools categorized by enrollment and participation at different levels with the High Schools That Works grant. Schools that participated in the HSTW grant performed better than non HSTW schools. Throughout the timeframe of the study, HSTW = 1 and HSTW = 2 scored nearly 5 mean MAP points better in the High Enrollment schools. In Low Enrollment schools, the mean MAP scores increased sharply for the first 3 years, performing 18 points better, and then in 1 year fell below non HSTW schools.

When considering the independent variables in HSTW schools, data shows that schools with a higher percentage of students on the free and reduced lunch program performed lower on the MAP test than schools with a lower free and reduced percentage.

Independent Variables

Other findings related to this study involved the performance of schools when impacted by the independent variables of enrollment, free and reduced lunch percentage, and per pupil expenditure. This study indicated that enrollment did not have a substantial impact on student performance.

One glaring outcome surrounded the percentage of students who qualified for free and reduced meals. In all instances, Low F/R schools performed substantially higher than High F/R schools. In all MAP areas and all grants where F/R significance occurred, schools that had a lower percentage of students eligible for free and reduced meals outperformed schools that had a higher percentage of students that qualified for free meals.

A final observation involved the performance of schools with different levels of spending per pupil. Research results indicated that different levels of spending per pupil did not have a significant impact on student achievement on the MAP tests or the ACT test. In a number of areas, schools that had Low PPE and Medium PPE actually performed better than schools that had High PPE.

Limitations of the Study

A number of limitations pertain to the data and the analyses. The limitations to this study, as stated in Chapter 1, were as follows:

One limitation on the study was that the data from the state achievement test included only five years (2000-2005).

A second limitation realized in the study was that the percentage of expenditures varies from district to district; therefore, some districts may spend substantially more funds for professional development than others.

A third limitation to the study was that by using the MAP test and ACT college entrance exam, the reliability and validity of the measuring instruments were not in question. The fact that the state of Missouri uses the MAP test to determine a school district's accreditation superseded whether the MAP test was reliable or valid. Likewise, since the ACT test is also used as a standard in determining district accreditation, the test reliability and validity was no concern.

A final limitation of the study realized midway into the project was the process and accuracy of the data attributed to eMINTS schools. Based on information gathered from the National eMINTS center, data was somewhat inaccurate in determining what classified an eMINTS school. A school building was classified as an eMINTS school as long as it had at least one classroom with a teacher who had received the eMINTS training. In addition, as trained eMINTS educators changed in a school building, either by changing classrooms, moving to other locations, or by retirement, there were no guarantees that the classroom(s) were continued with a qualified individual. Finally, an accurate list of eMINTS schools was difficult to obtain; therefore, comparison data was

used for buildings that had eMINTS at least once somewhere within the timeframe of the study.

Discussion

On the basis of this study alone, it is difficult to determine the overall impact of professional development on student achievement. These results do not isolate any particular aspect of the reform programs; they cannot isolate the effect of professional development in the classroom from the effect of instructional practice. Nevertheless, these results do support the contention that implementation of the Reading First program in schools and classrooms does contribute to higher levels of student performance. In addition, it is difficult to state that increased student achievement resulted from a specific reform model of professional development. However, increased achievement scores can be significant indicators that justify links to the professional development used in the reform grants.

The Reading First grant, in this study, showed significant gains in achievement, especially after participating for 2 years. Accepting the claim that it is successful causes one to examine the reasons for its achievement. In researching the program, three components can be identified. First, and foremost, teachers have to commit to the program and implement the strategies obtained from professional development. Secondly, having coaches or coordinators to assist in daily routines and who can model appropriate behavior is invaluable. Finally, Reading First has a system of accountability that includes ongoing meetings for coaches, a system of built in professional

development or training, and ongoing formative assessment. According to this research, the Reading First grant experienced greater success than the other grants in this study.

Findings from the eMINTS grant were somewhat puzzling and disappointing. Based on the results, eMINTS had little or no gains in achievement. While this study determined no significant gains in student achievement, the literature and other studies have shown positive results (Huntley and Greever-Rice, 2007). Ironically, when considering all the grants selected in this study, eMINTS instructors had more required hours of professional development than any of the other three grants. eMINTS teachers received up to 250 hours of professional development during the first two years of the program.

Results from data analysis showed a peak in MAP scores after the first full year only to decline the next year. However, based on this study, eMINTS did not show significant gains throughout the 5 years. The lack of student achievement could be attributed to a number of factors; however, one factor prevailed. The largest obstacle in the process of gathering data was trying to obtain an accurate list of eMINTS schools and classrooms. The eMINTS National Center did not have an accurate list and stated that their data was analyzed by the Missouri's Office of Social and Economic Data Analysis (OSEDA). However, when OSEDA was contacted, the person who had analyzed the data was no longer employed, therefore, creating another obstacle. Finally, after a number of attempts, a list of eMINTS schools was obtained from DESE. Once a list was obtained, identifying which schools were classified as a third grade eMINTS or as a fourth grade eMINTS classroom proved difficult. In addition, school buildings were classified as an eMINTS school if they had one eMINTS classroom. Therefore, for this study, if a school

had one eMINTS classroom, it was identified as an eMINTS school, regardless of the total number of classrooms at a particular grade level. In other words, if a school had one eMINTS classroom in the third grade, but there were 5 third grade classrooms, the entire third grade data was analyzed as an eMINTS building. Another obstacle encountered surrounded the issue of classroom changes. Data over the 5 years was obtained on the school buildings identified, yet, schools that dropped out of the program or classrooms that had shifted to other buildings were still identified as part of the eMINTS program. Another dilemma was determining whether trained teachers retired, moved, left, or if replacement teachers received the official eMINTS training. These classrooms or buildings were still classified as an eMINTS program.

The issue of how long it took to implement the eMINTS program was another factor that may have contributed to insignificant performance. During the first 2 years, new eMINTS teachers had to undergo the required professional development which pulled teachers out of the classroom several days. Teachers were given a teacher laptop in advance so they would become knowledgeable with the technology. However, student computers, SMART boards, and other technological devices were not installed until several months later. Because of the time schedule during the first year, the classroom was in constant transition.

The Comprehensive School Reform (CSR) and High Schools That Work (HSTW) grants had similar results. Based on the research, CSR and HSTW schools did not have significant gains over schools that did not implement either reform grant. The only areas of significance identified were in relation to the independent variables. Unlike, the Reading First Grant and the eMINTS grant, the professional development required was

not as organized. In addition, these two grants did not have the "checks and balances" associated with Reading First and eMINTS. Whereas the Reading First grant and the eMINTS grant were continuously evaluated based on their data, the CSR and HSTW programs were evaluated based on presentations and implementation of building determined goals. Achievement data was not directly used at the state or federal level to determine the success of the programs.

Implications for Future Research

A review of related scholarly literature found a lack of research based exclusively on the impact of professional development on student achievement. Even though reports link some aspects of professional development to student achievement, no foolproof methods of implementing professional development guaranteed student achievement.

Professional development, now, and in the future, will become even more important in meeting the needs of teachers and students. Teachers who are well prepared and trained are more effective in the classroom and therefore have the greatest impact on student learning (Killion, 1999). We also know that the best way to increase teacher effectiveness in the classroom is through regular, high quality professional development. Teachers themselves report that the more time they spend in professional development activities, the more likely they were to indicate that it had improved their instruction (Killion, 1999; National Center for Education Statistics, 2001).

Further research should be pursued that analyzes eMINTS data over extended years rather than just year to year comparisons of eMINTS schools and non eMINTS schools. Currently, eMINTS reports are written which compare the various subgroups of

the MAP test (Step 1, Progressing, Nearing Proficient, Proficient and Advanced), and how identified groups of students perform (i.e., Title I, Free and Reduced, gender, etc.). A study comparing how eMINTS schools perform over a longer period of time would be a more valuable indicator of its long term success. This study should include mean MAP data and how the scores compare over a longer period of time.

One of the most critical areas of professional development that should be scrutinized is evaluation. Analyzing the impact of professional development on student learning is an almost nonexistent component of professional development evaluations. This oversight is due to the normal difficulties of measuring student achievement and the complexity of determining whether any observed improvement was, in fact, attributable to professional development. More research is needed in examining reform programs which have professional development as a primary component. Professional development alone does not ensure student success. Schools should include evaluation procedures in any implemented professional development so they can understand the impact of the activities on student learning. Current evidence indicates that false or exaggerated claims of success are the basis of many school reform strategies—in large part because we lack better and more timely evaluations of new practices and programs—and their implementation (Consortium for Policy Research in Education, 1996).

Another important area that needs further research is the impact that school administration plays through support of staff development or leadership through reform models. Principals and central office administration should be supportive of a teacher's desire to grow professionally. A future study in the area of staff development could contain the principals' and central office staffs' perceptions of continuing professional

growth opportunities for all teachers in order to promote student achievement. In addition, administrators need to be actively seeking and involved in professional development activities.

More research that examines the link between high quality professional development and student learning outcomes is also needed. As schools participate in reform grants, they should request research results from any professional development provider they consider working with so they can select the most effective training activities.

Not surprisingly, the findings from this study suggest a need to improve the type of professional development taking place in school districts. Based on the findings in this research, professional development should include a research-based model of job-embedded, sustained, and systemic professional development. The districts' professional development styles should include ways for teachers to participate in professional development that is sustained and systematic, during the school day.

Finally, additional research is needed to confirm the findings of this study. This study needs to be repeated in other schools, districts, and states concerning similar reform grants or grants that require professional development. Other states implement Reading First, eMINTS, Comprehensive School Reform, and High Schools That Work. Continued research will aid in developing information that can be generalized to districts and schools across the United States. This, in turn, will increase the research base to support affirmation that professional development does make a difference in teacher knowledge and student achievement.

Conclusion

The results of this study have broad based implications for school districts in how they select professional development and the types of vehicles they use to enhance teacher quality to improve student achievement.

Professional development for teachers has become a major focus of school reform initiatives as many policymakers, researchers, and other members of the education community have come to believe that further gains in teacher effectiveness and student achievement require significant changes in teachers' knowledge and teaching practices. Teacher professional development has traditionally been viewed as a local responsibility, but, in recent years, the federal government and many state governments have assumed a more active role than in the past. At the federal level, a National Goal has been added, a set of principles for effective professional development has been articulated by the U.S. Department of Education, and funding for professional development activities has been provided through a variety of mechanisms (Choy, 1998).

Teacher professional development directly influences student learning. The instructional practices of teachers do have an impact on the performance of students. It is imperative that school districts provide opportunities for teachers to be actively involved in systematic professional development. In an effort to improve student achievement, a plan to evaluate professional development to ensure student learning is absolutely essential.

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