Spring 3-2009

Exploring the Effects of School Calendars on Student Achievement

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EXPLORING THE EFFECTS OF SCHOOL CALENDARS ON STUDENT ACHIEVEMENT

by

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March 2009

Dissertation submitted to the Education Faculty of Lindenwood University
in partial fulfillment of the requirements for the degree of

Doctor of Education

School of Education

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This Dissertation has been approved as partial fulfillment of the requirements for the degree of
Doctor of Education
at Lindenwood University by the School of Education

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March 18, 2009

TO: School of Education

This is to verify that Malinda R. Meier has presented this Doctor of Education Dissertation to the Doctor of Education Degree Dissertation Committee:

Dissertation Project Title: EXPLORING THE EFFECTS OF SCHOOL CALENDARS ON STUDENT ACHIEVEMENT

Date of Dissertation Completion: March 18, 2009

Grade (Pass/Fail): Pass

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DECLARATION OF ORIGINALITY

I do hereby declare and attest to the fact that this is an original study based solely upon my own scholarly work here at Lindenwood University and that I have not submitted it for any other college or university course or degree here or elsewhere.

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Acknowledgements

The author would like to acknowledge Dr. William Emrick for all of his support and direction for this project. Great appreciation also goes to my other committee members, Dr. Jennifer White, Dr. Cynthia Vitale, Dr. Larry Matthews, and Dr. Jackie Floyd, who have provided a great deal of support and guidance throughout this entire process. My mother should receive special recognition for her time, support and encouragement. She always told me I could do anything if I worked hard. Most of all, my husband, Scott, and children, Jordan, Chase, and Maddox, deserve recognition for their patience and support during the many evenings and weekends where this project took priority. I could not have completed this project without all of their love and support!

Abstract

The purpose of this study was to investigate the impact of a year-round calendar and an extended school year calendar, which had, in addition to extra days, specific teacher selection, extended professional development for teachers, and research based programs on student academic achievement. This special version of an extended school year was referred to as *extended plus.* To determine the effects of a year-round schedule, Missouri Assessment Program (MAP) test scores of students attending school on a year-round schedule were compared to scores of students attending schools on a traditional schedule. To determine the effects of extended plus, MAP scores of students in schools on a traditional schedule were compared to those of students in the same school district attending extended plus. These test scores were compared over five years to monitor differences and trends.

Results of this study concluded that there was not a significant difference between student test scores in schools on a year-round calendar and those in schools on a traditional calendar over time. Some years the year-round schools had better scores and some years the traditional schools had better scores, suggesting that students on a year-round calendar do not have an academic advantage over those on a traditional calendar. The review of literature supported these findings. The results for extended plus concluded that the students did show a significant increase in test scores in the area of communication arts, but not a significant increase in the area of math, though there was enough increase to nearly close the gap between the students attending extended plus and

those on the traditional school year. From the data collected in this study, extended plus had a positive impact on student achievement.

Schools considering an alternative school calendar to improve student achievement should look at all of the options and consider the components beyond the calendar itself. The results of this study suggest that it is not the number of days students attend school, but what happens in the time that they are there.

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CHAPTER ONE – INTRODUCTION

Background of the Study

The traditional school year in the United States consists of nine months of classes from fall through spring, followed by a three-month break in the summer. Schools following the traditional school year generally begin in late August or early September, have two to three days of break at Thanksgiving, one to two weeks of break around Christmas and approximately a week in the spring; students finish in late May or early June. At this time, the students begin their long summer break of ten to twelve weeks before the beginning of the next year (National Association for Year-Round Education, 2005). The traditional school year developed as a result of the demands of an agricultural society in place previous to the twentieth century. As society became more industrialized, the need for summer help from children lessened.

Although the traditional school year is still the most common schedule, some districts have turned to alternative schedules in order to meet their fiscal or spatial needs or to enhance the learning experiences of students. One alternative schedule, referred to as the year-round calendar, is a variation of the traditional school year. It includes the same number of days, but the days are spread differently throughout the year by inserting periodic breaks thus shortening the summer break. There are different ways of implementing a year-round school year: multi-track (meaning students attend on overlapping schedules with breaks at different times) and single-track (meaning all students attend at the same time.) For this study, both multi-track and single-track will be referred to as year-round schools. No distinction will be made between these tracks.

Another alternative schedule is referred to as the extended school year calendar, in which the students actually attend more days of class than in the traditional school year. When implementing the extended school year schedule, District EP also added specific teacher selection, extended professional development opportunities for teachers and research based teaching strategies (Ferguson-Florissant School District, 1998). For the purposes of this study, this unique type of extended school year will be referred to as *extended plus.*

Educational leaders are examining both types of schedules as they search for ways to improve academic achievement and strive to meet the expectations of the recent No Child Left Behind legislation. This study was an effort to determine the impact of alternative school calendars on standardized test scores in districts in which they have been implemented.

Test results from the Missouri Assessment Program (MAP) were used as a means to determine which type of school calendar was most effective in raising student achievement. MAP scores from students in similar schools that used different calendar models were compared to determine the existence of any significant difference.

Year-round schools. The year-round calendar has been used by school districts around the country for over one hundred years to deal with overcrowding, but many also feel there is higher academic achievement in schools on a year-round school schedule because there is no prolonged summer vacation to reduce retention of information learned. This belief has been a source of debate and study since its inception. The first year-round schools began in 1904 in Bluffton, Indiana (Palmer & Bemis, 1999; National Association for Year-Round Education, 2005) using a schedule in which summer break

time was divided throughout the year, but all students attended at the same time and were off at the same time. Students attended the same number of days as students on a traditional calendar. This is now referred to as a single-track year-round calendar.

In 1969, District YR in the Midwest region of the United States, which is one focus of this study, started the first multi-track school schedule in the nation. In this model, the students and teachers are separated into groups and attend school on a rotating schedule in which there are always students in attendance while others are on break. Due to this rotation, multi-track calendars can increase the capacity of a school by up to thirty-three percent because the facilities remain in use all year with no breaks (National Association for Year-Round Education, 2005). Throughout the years that followed, the use of a year-round calendar has grown tremendously.

Originally, District YR utilized a year-round schedule in response to a lack of space at the elementary level caused by a rapid growth of its population. At that time, the district used a multi-track schedule in order to service all of the students. There were four *cycles* in which three groups of students were in session and one on break at any given time. Once enough elementary schools had been built to accommodate the student population, the district changed to the current single-track system in which all elementary students attend school at the same time with their breaks spread throughout the year. The school calendar now begins in mid-July. Students attend classes for three quarters of approximately nine weeks each, with cycle breaks of three weeks between the quarters, and a six-week summer break in June and July. Because the middle school and high school students in District YR attend on a traditional calendar, there are times when busses are running only for the elementary schools or only the middle and high schools,

rather than all three levels. Consequently, according to Dr. Cathy Bear, an assistant superintendent of District YR, in 1995 there was an additional cost of approximately $690,000.00 per year to run the year-round calendar in this district (C. Bear, personal communication, October 12, 2005).

With new expectations and accountability from the No Child Left Behind Act of 2001 (U.S. Department of Education, 2008), educators must ensure that money is spent in ways that have the greatest effect on student education. In its attempt to control expenses while meeting essential needs, District YR must structure its budget to eliminate those items that have the least impact on student achievement and well-being. This has led to a discussion regarding whether to keep the year-round schedule in light of its higher cost.

The topic of the year-round calendar has been debated in committee meetings as well as in the neighborhoods, with various opinions expressed. Speck (2002) argued that students could retain more information with frequent breaks than with one long summer break (¶ 5). In evaluating this argument, test scores on the MAP could be compared between students on a year-round calendar and those on a traditional calendar. If the argument is valid, students who attend year-round schools should have higher test scores than those on a traditional calendar when all teachers are teaching to the Missouri Grade Level Expectations (Missouri Department of Elementary and Secondary Education, 2008b).

Extended school year.

Poor academic achievement of American K-12 students in comparison to other industrialized nations has led state departments of education, local school districts, and various groups supporting public schools to take a close look at

> extending the school day and/or the school year in order to boost student achievement. (Neal, 2008, p. 1)

When the report *A Nation at Risk* was published in 1983 showing that the United States ranked behind other countries in mathematics and science, some started looking at extending the school calendar to allow students to attend school the full year (Delp, 2008). In America, schools in most states have a school year that averages approximately 180 days for students, while many other nations have more school days and more hours each day (Farbman & Kaplan, 2005; Fonda, 2007). Students in England, for example, attend school up to eight hours a day for 220 days a year (Ellis, 1984). When compared to a traditional school calendar, an extended school year calendar includes additional attendance days added in the summer (Johnson & Spradlin, 2007). The idea of more days in a school year has many positives, but a great expense accompanies adding days to the school year. According to the Education Commission of the States, (Fonda, 2007) it would cost an estimated $39,633,000 per day for the entire state of Missouri to add days to district calendars.

School District EP in St. Louis County, Missouri, the second focus of this study, implemented an extended school year in 1998 when it found that four of its elementary schools were on the verge of academic deficiency. This involved adding twenty-five school days to the student calendar in the deficient schools, and fourteen additional days, beyond the student days, for staff, resulting in the students attending school 200 days instead of the 175 that were required by the state at that time (Bower, 1998). Unlike the traditional summer school where students would have a new teacher, these students had the same teacher for the entire extended year (Bower, 2001).

To prepare the district for a change to an extended school year calendar, there were necessities and expenses. Besides the salary for teachers working extra days, the district had to spend $1 million to install air conditioning in one of the buildings (Ferguson-Florissant School District, 1998). They had to provide in-service training to teachers to prepare them for the changes in instructional strategies and programs for the new plan. The district even hired permanent substitute teachers who were trained in the reading programs to provide continuity when the teachers were out of the classroom. The community also had to be educated, as the families living in the affected areas had to change their way of thinking about the summer months and their scheduling of family vacations.

Statement of the Problem

A large number of schools nationwide are unable to meet the No Child Left Behind expectations for Annual Yearly Progress (Silva, 2007, p. 1). The purpose of this study was to compare both a year-round school calendar and an extended school year calendar with specific teacher selection, extended professional development for teachers, and research based programs (referred to as extended plus) to a traditional school calendar to determine their impact on student academic achievement.

Rationale for Study

With the heightened expectations brought on by the No Child Left Behind legislation in recent years, school districts around the country have increased their efforts to find strategies that would improve academic achievement and raise their students' test scores to meet the increasing requirements. Many schools have been unable to meet these raised expectations and are searching for ways to improve student achievement. One

strategy explored includes changing the format of the school calendar. Since changes to the school year calendar can be both financially costly and disturbing to the lifestyles of the families of the students involved, data is needed to determine what, if any, change will produce the desired academic improvement.

Within adjoining St. Louis County and St. Charles County in the suburbs of St. Louis, Missouri, are school districts using the three most common school year calendars. In their elementary schools, District TR, in St. Charles County, has a traditional school year calendar. District YR, also in St. Charles County, has a single-track year-round calendar, and District EP, in St. Louis County, has a traditional calendar in some schools, but an extended plus program in four other elementary schools that includes specific teacher selection, extended professional development for teachers, and research based programs as well as additional school days for students.

District YR has a year-round school calendar that was originally put in place to respond to a rapid and overwhelming population growth in the district. Once facilities had been built sufficient to accommodate the student population, many residents began to question the value of continuing the year-round system. They pointed out that under the year-round schedule, the summer break was much shorter, which limited summer activities, such as family vacations and camps. Sports, which were scheduled later in the evening in the summer, caused students to be out late on school nights when they would traditionally have summer break. Also, parents with students at both elementary and secondary levels had problems when vacations did not coincide. For example, the older students were off all summer when the younger ones had to go to school and the younger students were off on breaks throughout the year when the older students were in school.

This caused difficulty for planning family activities and supervision of the younger students (Bear, personal communication, October 12, 2005).

Proponents of the year-round calendar, on the other hand, argued that more frequent breaks encouraged better student attendance by reducing the fatigue of long sessions, while also allowing families to take vacations at times other than summer. They believed that the year-round schedule's lack of extended summer breaks would improve retention and result in better learning (Morgan, 2003). If this was true, student achievement as measured by MAP scores should have been higher for students attending schools on the year-round schedule than for those attending schools on the traditional schedule.

Financial considerations were also a factor in this controversy. Due to additional transportation costs, District YR spends approximately $690,000.00 per year to maintain a year-round calendar at the elementary level while having the secondary schools on a traditional calendar (Bear, personal communication, October 12, 2005). With the reduction in state funding to public schools in Missouri, many districts asked taxpayers to provide more money per year for their districts. The rise in taxes caused taxpayers to question expenditures. Few objected to paying extra taxes for the year-round schedule if it improved retention of knowledge and students scored better on standardized tests. However, the taxpayers required evidence that this allocation of funds was worthwhile.

District EP's extended plus began in 1998 as a way to improve student standardized test scores at four elementary schools: EP1, EP2, EP3, and EP4 (Bower, 1998). These four schools were targeted because their student scores, as measured on the MAP, were some of the lowest in the state of Missouri. The first year of implementation

included 25 extra days for the students at the designated schools; these days were all added on at the end of the school year. Students began school at the end of August with all the other students in District EP, but at the end of the year, they had a one-week break then returned until late July (Bower, 1998). Some parents spoke out against the change in schedules because they felt the children needed the opportunity to participate in other summer activities during that time. Other parents stated that they felt it was a good idea.

Additional costs were required to make this schedule change, as well as to implement training to assist teachers with the task of improvement. The first year was projected to cost approximately $1,290,806 with increased wages accounting for the majority of the expense (Ferguson-Florissant School District, 1998). According to the St. Louis Post-Dispatch, (Bower, 1998) the state provided about $1.2 million toward these expenses. The district believed that the expense would be warranted if the change improved the students' test scores.

Independent Variable

The independent variable was the type of school calendar: year-round and extended plus versus traditional. On a traditional calendar, students attend school for approximately nine months with a three-month summer break. On a year-round schedule, students attend school the same number of days per year as students on traditional schedules, but attend four approximately nine-week sessions separated by three three-week breaks and an approximately six-week summer break. The extended plus school year calendar contains extra school days and has a shortened summer break and in this study, specific teacher selection, extended professional development for teachers, and research based programs.

Dependent Variable

The dependent variable was the academic achievement of elementary students as measured through student scores on the MAP test in the areas of communication arts and mathematics at grades three and four.

Hypotheses

This study focused on the impact of a school calendar on student achievement with two hypotheses:

If students attend school on a variation of the traditional school year, also known as a year-round schedule, which alternates between roughly nine weeks on and three weeks off, then their MAP test scores will be significantly higher than students who attend school on a traditional school year that is roughly nine months on and three months off.

If students attend school at an extended plus school, then their MAP test scores will be significantly higher than students who attend school on a traditional school year.

Limitations of the Study

Subject. This study compared students in different schools and school districts. Because of this, the characteristics of the students were not identical. The groups may have contained students with different socioeconomic levels and ethnicity as well as students of different ages. Since the investigator did not choose the members of the groups, these differences could not be avoided.

Location. The students in this study took the tests in a variety of different schools and different classrooms. Different student behavior in the classrooms could have caused a difference in the standardized test scores. The size of the classrooms and physical

differences, such as lighting, temperature and noise levels, may have varied between districts and rooms. These variables could account for higher or lower performance by students.

Implementation. The students in this study took the test after instruction by different classroom teachers. These teachers had different teaching styles and classroom set-ups. Although they may have been teaching the same concepts, each teacher had a different way of teaching and may have reached learners differently. For instance, students may learn ideas differently when taught by the inquiry method than those taught by the lecture method. In addition, learning may have been influenced by the differing abilities of the teachers involved.

History. The study did not show what the students had experienced prior to the testing. Personal events that took place prior to testing in the lives of the students or of the groups involved in this study were unknown and could possibly have affected their performance.

Definition of Terms

Academic achievement. The level of learning measured by MAP testing.

Adequate Yearly Progress (AYP). A measurement defined by each state to meet the demands of the United States federal No Child Left Behind Act which allows the U.S. Department of Education to determine if students in every public school in the country are performing to the set requirements.

Allocated time. "The time that the state, district, school, or teacher provides the student for instruction" (Berliner, 1990, p. 2). This may also be referred to as scheduled time.

Engaged time. The time when students are engaged in a lesson that has instructional goals. This time is a portion of the allocated time for each student.

Expanded learning program. For the purposes of this study, an extended school year with 25 additional days over all variations of the traditional calendar, specific teacher selection, extended professional development for teachers, and research based learning programs.

Extended school year. A school calendar in which students attend school more days than students who attend school on a traditional calendar. Extended school year includes a continued focus on instruction correlated to state guidelines.

Instructional time. The amount of time students spend in class for core, non-core and elective classes.

Missouri Assessment Program (MAP). The Missouri standardized test to measure student achievement in the areas of communication arts, mathematics, science, and social studies. Scores from this test are used to determine if districts meet the requirements of the No Child Left Behind legislation. All students attending public schools in Missouri are required to participate in this testing during the spring of each school year.

Multi-track schedule. A form of year-round schooling in which groups of students and their teachers are assigned different school year tracks, with the schedule of attendance periods and break periods differing from other groups. At any one time, one group of students is on break while others are in attendance. This creates a *school-within-a-school* concept. Use of this calendar can increase the capacity of a building by as much as 33% (National Association for Year-Round Education, 2005).

No Child Left Behind Act of 2001. A federal education reform that mandated every child be educated and held school districts accountable. This Act requires testing at given grade levels with performance standards for all districts in the areas of communication arts, including reading, and mathematics.

Non-instructional time. The part of the day that students are engaged in non-academic activities, like recess, lunch, passing time, or assemblies.

Professional development. "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, p.16).

Single-track schedule. One form of year-round schooling where all students attend school and are on break at the same time. This involves shorter breaks throughout the year, including a shorter summer break.

Traditional school year. One in which classes are held for nine months, followed by a three month summer break. A school on this calendar generally starts classes in mid-August to September and concludes the year in May or June.

Year-round schools. Reorganizes the school year to provide more continuity in learning by having short, periodic breaks throughout the year rather than a long summer break. Students who attend school on a year-round calendar receive the same classes and same instructional hours as those on a traditional calendar, but the time is divided differently throughout the year.

Summary

The researcher in this study compared both a year-round school calendar and an extended school year calendar with specific teacher selection, extended professional

development for teachers, and research based programs (referred to as extended plus) to a traditional school calendar to determine their impact on student academic achievement. In an age of higher expectations for schools, districts must find ways to increase student achievement. Students in the state of Missouri are given the MAP test to determine the school districts' success in teaching required skills. The researcher compared scores from the different types of school schedules to determine the impact of the schedule that students attend on their achievement in the classroom. Some studies have shown that there is no significant difference in standardized test scores between students on a year-round calendar and those on a traditional calendar (Chaika, 1999), while other studies have shown contradictory results. In other studies, students showed academic improvement on an extended year calendar when new, research based programs were also put into place. A review of the literature related to three possible school schedules — year-round, extended, and traditional, has been provided in Chapter Two.

CHAPTER TWO – REVIEW OF LITERATURE

Throughout the history of the United States, school calendars have been lengthened and shortened in order to meet the specific needs of the local community. According to Silva (2007), in the beginning of the nineteenth century, large cities commonly had long school years, ranging from 251 to 260 days. As an elite class of wealthy families emerged, their desire to take extensive vacations resulted in a shortening of the school year. Summer breaks were gradually elongated in many schools in large cities until, by 1889, they extended through July and August. Schools in rural communities had shorter school years so that children were available to work on the family farms during the long summer breaks. During the 19th century, many of these rural schools were only open about six months out of the year (Johnson & Spradlin, 2007). Since there were few compulsory school attendance laws at that time, rural students attended as few as 99 days in an average school year of 144 days.

After the Civil War, the merging of urban and rural interests led to the establishment of what is now referred to as the traditional calendar (Johnson & Spradlin, 2007, p. 2). Students would attend school from late August through late May, and then be off school during the summer months to work the farm. By the 1960's, most schools in the country had settled on a calendar of 170 to 180 six and one-half hour days, with five school days in a week (Silva, 2007). Perhaps one of the most interesting things about the traditional calendar of 180 days is the fact that it has become universal in the United States. Despite the specific needs that have developed in the different schools, most are still very close to that number (Johnson & Spradlin, 2007, p. 2).

In order to compare student achievement in schools with traditional schedules to those with year-round schedules, the MAP scores of two school districts from St. Charles County, Missouri, were used: District TR, which has a traditional calendar, and District YR, which operates its elementary schools on a year-round calendar. When comparing the extended school calendar with the traditional calendar, MAP scores from elementary schools in District EP in St. Louis County, Missouri, were used. Four elementary schools in this district operate on an extended school year calendar, while the other elementary schools in the district attend on a traditional calendar. The standardized MAP tests are administered to all Missouri students in grades three through eleven and are used by the state to qualify schools for funding. By comparing the MAP scores in these districts, a determination can be made about the educational value of the year-round and extended calendars. This information can be valuable to the districts in deciding how to best utilize their tax dollars.

Year-Round Schedule

Introduction of the year-round schedule. Since it is no longer necessary for students to be available to work in the fields in the summer in most areas of the country, many schools are moving to a different type of school calendar to meet the needs of their students. In addition, statistics show the United States has fallen behind other countries in its academic achievement and educators have been trying to find new approaches to improvement in this area. “In 2005-06, about 2,200 public elementary schools and nearly 300 public middle schools in the United States were following a modified schedule” (St. Gerard, 2007, p. 58). This was up from 408 schools in 1987 (National Association for Year-Round Education, 2005). The No Child Left Behind legislation passed by congress

January 8, 2002, (U.S. Department of Education, 2008) demanded that schools improve student success on standardized tests. Furthermore, this legislation requires that all students must perform at a proficient level. Educators are striving to find ways to meet these demands and are considering modifications to school calendars as a means to do so. Proponents of the year-round calendar claim that it allows students to perform better on these tests because they retain information better without a long summer break (Lawson, 2002).

The term *year-round school* does not mean that students actually attend school all year, but that their days of attendance are more evenly spread around the year than with the traditional calendar, resulting in shorter but more frequent breaks with the same number of school days. The National Association of Year-Round Education has reported the following:

> Year-round education centers on reorganizing the school year to provide more continuous learning by breaking up the long summer vacation into shorter, more frequent vacations throughout the year. It does not eliminate the summer vacation, but reduces it and redistributes it as vacation or intersession time during the school year. Students attending a year-round school go to the same classes and receive the same instruction as students on a traditional calendar. The year-round calendar is organized into instructional periods and vacation weeks that are more evenly balanced across 12 months than the traditional school calendar. The balanced calendar minimizes the learning loss that occurs during a typical three-month summer vacation. (2008, About YRE section, ¶ 2)

Most year-round schools have nine or ten weeks of classes alternating with two or three week breaks and a longer, five or six week break in the summer (Lawson, 2002). Year-round schools can operate in two general ways. On a single-track schedule, all students are on break at the same time. However, on a multi-track schedule students are divided into a number of groups and the year is divided into an equal number of attendance periods. A different group is on break during each attendance period. The multi-track schedule is used primarily when districts do not have enough space for all of their students to attend at one time. This can represent a considerable capital savings for the school district by postponing or eliminating the need for constructing more buildings (Chaika, 1999).

History of the year-round schedule. In 1904, the first year-round school in the United States began in Bluffton, Indiana, to increase the school's capacity and to increase student achievement (Palmer & Bemis, 1999). From 1910 to 1938, different year-round calendars were used to accommodate more students, improve the quality of education, and meet the needs of the children of European immigrants trying to learn English. It was also during this time that the first mandated K-12 year-round program began in Aliquippa, PA. Over the next thirty years, public concern with World War II, rebuilding America, and the Korean and Vietnam Wars put consideration of year-round schools on hold. This continued until 1968 when Park Elementary in Hayward, California implemented the first year-round school following World War II. It remains the longest-running year-round calendar in the nation (National Association for Year-Round Education, 2005).

In 1969, District YR in St. Charles, Missouri, instituted the first multiple-track calendar in the nation in response to tremendous population growth within its boundaries (National Association for Year-Round Education, 2005). Since that time, many other districts have started year-round scheduling. The Valley View School District in Romeoville, Illinois, became the first district in the United States to implement a multi-track calendar for the entire district in 1970. They returned to the traditional calendar, however, when the district's enrollment declined to a level that could be accommodated in their existing buildings (McGlynn, 2002).

In 2003, there were more than 560 districts in 46 states that participated in some type of year-round calendar (National Association for Year-Round Education, 2005). According to the National Association of Year Round Education, this represented a 544% growth from the 69 districts using a year-round calendar during the 1986-1987 school year (see Table 1).

Table 1

Growth of Year-Round Education 1986-2003

SCHOOL YEAR	STATES	DISTRICTS	SCHOOLS	STUDENTS
1986-1987	14	69	408	362,669
1995-1996	37	447	2368	1,754,947
2002-2003	46	565	3,181	2,320,730

Note. From National Association for Year-Round Education, 2005.

Basic types of year-round scheduling. Year-round scheduling can be of two basic types: single-track and multi-track (Palmer & Bemis, 1999). The single–track, year-round schedule balances the school calendar throughout the year, with all students and faculty following the same schedule of instructional and break periods. Student breaks are spread throughout the school year and commonly referred to as *cycle breaks*. This program does not increase the maximum number of students that a school building can accommodate, but allows all students to be on break at the same time.

Multi-track year-round education is used primarily to eliminate overcrowding in schools. Mrozowski (2002) concluded that by staggering the breaks throughout the year, schools are able to utilize their space all year rather than only nine months. According to the National Association for Year-Round Education (2005), students and teachers on a multi-track schedule are placed into equal-sized groups. These groups, or tracks, each have their own schedule. While one group is on break, the other groups are attending classes, so there is never a time when all tracks are in session at one time. Multi-track systems can be organized in a variety of ways. One example of this is the 45-15 model. Students attend classes for 45 days and then have a break for 15 days. The 45-15 model allows students to attend four equal sessions with four equal breaks. Another multi-track model is the 60-20 calendar. On this schedule, students attend classes for 60 days followed by a 20-day break. Multi-track scheduling can increase the capacity of a school by up to 33% when using a three-track system.

Although there are positives to a multi-track system, there are also many drawbacks. When rooms are in use almost all of the time, it is difficult to schedule and perform cleaning and maintenance that needs to occur to keep the school in working

condition. Teachers must vacate their rooms when they go on a break to accommodate the incoming classes of other tracks; this requires moving their belongings frequently. Consequently, most teachers keep their supplies in wheeled cabinets so they can easily transfer them to their next classroom. Scheduling activities is also difficult. Many find they must schedule at least two dates for events like open house, school pictures, state testing, and other activities for all students since there is no time when all students attend together (Chaika, 1999). These challenges can all be overcome with thought and preparation, but must be considered when looking at a multi-track calendar. For the purpose of this study, the two types of year-round schedules are considered the same and, from this point, will simply be referred to as *year-round*.

Student achievement on a year-round schedule. "One of the most important reasons for eliminating the traditional schedule and moving toward [year-round education] is to enhance flexibility and continuity in the curriculum." (Bray & Roellke, 1998, ¶ 13) Many researchers have conducted reviews of literature to determine the effects of year-round education on academic achievement. One observation was that student achievement was at least as good in schools with a year-round schedule as in schools with a traditional schedule (EPE Research Center, 2004).

A study by Worthen and Zsiray in 1994 (as cited by McMillen, n.d.) made several conclusions regarding a year-round program:

1. Student achievement in year-round schools was equal to or greater than achievement in the traditional schools.
2. Students and teachers had more positive attitudes when on a year-round schedule.

3. Most parents were satisfied with year-round programs if they were well implemented.
4. Single-track programs cost as much or more than traditional programs, but multi-track programs resulted in significant savings if well implemented. (¶ 9)

Some year-round programs did show significant increases in student achievement. Ballinger attributed part of that increase to the remediation and enrichment activities provided to students during their breaks. She noted that focused, well planned remediation for struggling students could take place during the next break rather than waiting until the end of the whole school year. More frequent breaks present an opportunity to take "immediate corrective action" (Ballinger, 1995, p. 29). Students might be able to return to class back on track and ready to move forward. These programs have proven to be very beneficial for cognitively and economically disadvantaged students (McMillen, n.d., ¶4).

According to a study by Harris Cooper (as cited in Duke University Office of News & Communications, 2004), students who attended on a year-round calendar showed slightly higher rates of retaining learned material, but parents or schools must have provided "high-quality remedial or enrichment programs for children during the intersession breaks" (¶ 7). Other studies have shown that students who were in programs like special education and those whose native language was not English received the greatest benefit from year-round education (Lawson, 2002, ¶ 14). In a seven-year longitudinal study by The New York Board of Regents looking at student retention of information over the summer break, students were tested at the end of the school year and

at the beginning of the new school year three months later. The study showed that economically disadvantaged students fell behind on test indicators over the summer break while others continued to gain. It was concluded that this discrepancy was due to the lack of a stimulating home environment for the economically disadvantaged students (Morgan, 2003, p. 10). In another study done by the University of Missouri and Tennessee State University, middle class students appeared to gain on reading tests over the summer while lower-class students regressed (Morgan, 2003, p. 11).

Winters (1994) reviewed 19 studies of academic growth in year-round schools and concluded that students on a year-round calendar scored better on achievement tests than those on a traditional calendar. In 48 of 58 categories, the year-round students outperformed those in a traditional system while the traditional students scored higher in only three categories. Seven of the categories showed mixed results.

According to Ballinger (1995), the most important reason for changing to a year-round calendar was to eliminate the significant learning loss that occurred during a long summer break. Research on cognitive retention and forgetting has shown that disadvantaged students forget more during periods out of school than other students do. This research suggested that the year-round calendar could increase student performance by reducing extended periods without schooling for those who could not depend on home environments to reinforce learning. It was noted that achievement test scores for students who were not disadvantaged either remained the same or increased during the summer months, depending on their summer activities. However, disadvantaged students showed a decline in achievement test scores over summer months. Therefore, the disadvantaged students fell further behind with each extended break. Morse (1992) also found that

disadvantaged students forgot as much as three months of learning each summer. He noted that at this rate they could be a full year behind after three summers and proposed that this would not be true if they were attending a year-round program. Alexander, Olson and Entwisle (2007) concluded, "Since it is low [income] youth specifically whose out-of-school learning lags behind, this summer shortfall relative to better-off children contributes to the perpetuation of family advantage and disadvantage across generations" (p. 175). Cooper, Valentine, Charlton and Melson (2003) determined that economically disadvantaged students showed higher academic achievement on a year-round schedule. Overall, however, their study showed no statistically significant difference between traditional calendar and year-round calendar on academic scores (p. 1).

East Garfield Park, Illinois' Alain Locke Charter Academy showed a ten percentage point increase in reading scores after implementing a year-round calendar. The new calendar followed a pattern of ten weeks of school and a three-week break with a total of 190 school days a year. Students and teachers in the school reported feeling more refreshed with the new schedule (Grossman, 2007, ¶ 15).

In 1994, Kneese matched 311 students in fourth, fifth, and sixth grade in a year-round class with students from traditional classes at the same school. Looking at both mathematics and reading scores, she found significant differences in favor of the students on a year-round calendar. Although all year-round students scored better in this study, at-risk students on this calendar showed the most significant difference in reading scores and low socioeconomic students performed better in mathematics and reading (Kneese, 1994).

The Socoro Independent School District in El Paso County, Texas, substantially improved in all areas after implementing a year-round calendar in 1991. Although the alternative calendar was adopted to solve a problem of overcrowding, they found many additional benefits. Beyond saving money and having their buildings open for the community year-round, performance on the state required tests also improved. In addition, intersession time was used for a variety of opportunities that included remediation for students who were not successful in all areas during the regular scheduled year (Barber, 1996).

Other studies have shown different results. Through a review of literature, Palmer and Bemis (1999) found that out of 75 analyses of student achievement in year-round schools, 27 showed significant positive effects while 42 revealed no significant effects. They concluded that there was no significant achievement difference between students attending year-round schools and those in traditional schools. Even in those studies that have shown an increase in student achievement, some of the investigators found that the increase was not significant (Naylor, 1995, ¶ 8).

The EPE Research Center (2004) reviewed 39 studies and concluded that year-round calendars have a very small, insignificant effect on improving student achievement. McMillan (2001) examined achievement differences between students in year-round and traditional-calendar schools using data from more than 345,000 students. He found that the achievement of students in the year-round program was no higher than that of students in a traditional program.

Janet Ferguson (1999) conducted a study of 84 fifth and sixth grade students from the same elementary school where 44 were on the year-round schedule and 40 were on a

traditional schedule. The students were given a series of three standardized mathematics tests: the first in the last week of school, the second upon returning to school after the summer break in August or September, and the third in December. For the first test, no significant differences in scores were found for either grade. On the second and third tests, both groups showed some improvement, but the difference between the groups was still not statistically significant.

In a study comparing academic achievement of third through eighth graders who attended year-round schools to that of students who attended traditional schools, McMillen (2001) found no significant differences in reading or mathematics. This study did imply "that lower achieving and Caucasian students may benefit slightly from being on a year-round calendar . . . [and] . . . students whose parents have high levels of education may do better under a traditional school calendar" (¶ 33).

Von Hippel (2007) studied test scores for kindergarten and first grade students in 748 public schools and 244 private schools in different parts of the country. He found no significant difference in scores for students in year-round schools compared with those on a traditional calendar. Students from economically disadvantaged families showed a slight improvement in reading test scores while on the year-round calendar, but no increase in mathematics scores. Von Hippel stated, "Year-round schools don't really solve the problem of the summer learning setback – they simply spread it out across the year" (¶ 8).

A rural North Carolina school district suggested that their year-round program showed no advantages in attendance or achievement. They found that the use of year-round education should be based on the fit in the community (Pittman & Herzog, 1998).

In a debate about the Winston-Salem district calendar, Superintendent Martin studied three years of data to compare student performance in schools that utilized a traditional calendar with those that had a year-round calendar when the schools were of similar demographics and enrollment. His findings showed that "African–American, Hispanic, and low-income students performed better on the year-round calendar . . . [and that the] . . . difference in the performance of white children was 'positive, but not significant' " (Cook, 2005, p. 25). These results suggest that a year-round schedule would not have a negative impact on student achievement.

Student attendance on a year-round schedule. There have not been many studies on the impact of a year-round calendar on student attendance. Although many believe that year-round schooling would bring about an increase in student attendance, studies show mixed results (Palmer & Bemis, 1999, ¶ 1). In a rural North Carolina school district, Pittman and Herzog (1998) found no attendance advantages. A 1997 study at two Calgary year-round schools reported improvement in student attendance upon the implementation of the modified calendar (Hunter, 1998, ¶ 5). Reviewing five studies, Elsberry (as cited in Palmer & Bemis, 1999) found that students on a year-round calendar had significantly better attendance than those on a traditional calendar. Palmer and Bemis (1999, ¶ 18), on the other hand, found a non-significant difference of less than two days in student attendance between the two programs. Student attendance does not appear to be impacted by a year-round schedule.

Teacher absenteeism with a year-round schedule. Palmer and Bemis (1999) reported that several studies showed a decrease in teacher absenteeism in schools on a year-round schedule; however, the differences were not statistically significant (¶ 19).

Five of the six studies showed a decrease in teacher absenteeism ranging from one to three days. According to Hayes (2001), some teachers waited to schedule personal appointments during breaks rather than taking days off during the year, thus improving teacher attendance (¶ 13). After the Trenton Special School District in Gibson County, Tennessee, adopted a year-round calendar, they saw a 30 percent decrease in the number of sick and personal leave days taken by teachers (Morgan, 2003, p.11). At two year-round schools in Calgary, a 1997 study showed teacher attendance improved when the new year-round calendar began (Hunter, 1998, ¶ 5). Opheim and Mohajer (1995) surveyed the principals from the 59 year-round elementary schools in Texas. The responses showed that those principals felt there was less teacher absenteeism on the year-round calendar (¶ 28). From the studies reviewed, it would seem that a year-round calendar has positive effects on teacher attendance.

Family impact of a year-round schedule. "Although there will always be some parents who do not like year-round calendars, most parents will be satisfied with a year-round program if it is well implemented" (Public Schools of North Carolina, 2000, p. 2). Several areas of parental concern regarding year-round education were scheduling vacations, childcare, and extracurricular activities, including sports (Shields & Oberg, 2000b). Studies on these topics showed mixed results but did show that once a year-round calendar was implemented, parents reported the areas of concern were not as difficult as they had anticipated (Palmer & Bemis, 1999, ¶ 29). Daycare providers accommodated the new demand by providing care during the times that students were on break. Some schools started their own programs for before and after care, as well as childcare during breaks (Morgan, 2003, p. 17).

Morgan (2003) found that families with students on different schedules seemed to adjust. Some parents found this more complicated when trying to schedule activities with the whole family. However, some parents enjoyed the opportunity to spend separate time with the children (p. 17). Non-custodial parents had more opportunities to have their children visit throughout the year instead of only in the summer (Shields & Oberg, 2000b). Overall, the parents with students on different schedules tended to support the year-round calendar less than those with students on the same schedule.

Family vacations are important to many families, and year-round calendars provided them with some unexpected advantages. For example, year-round calendars allow families to take vacations during off-season times where they can get a lower price and shorter lines (Warrick-Harris, 1995, ¶ 6). Some parents are unable to take vacation during the summer months, and the year-round calendar allows them to vacation during other months without taking their children out of school.

Student and teacher attitudes of a year-round schedule. Some researchers believed that students and teachers on a year-round calendar would have improved attitudes because of the frequent breaks. Only a few studies have been conducted on students' attitudes with a year-round schedule. Of those, most showed no significance; however, two studies showed students on a traditional calendar scored significantly higher in the areas of self-acceptance and self-concept than those on a year-round calendar. The principal at Hilo Intermediate School in Hawaii noticed the number of student fights in the first quarter dropped from sixty-eight on a traditional calendar to only five during their first year on a year-round calendar. They attributed this to the students knowing they had a break coming soon (Wildavsky, 1999, ¶ 9).

Most studies of teachers' attitudes showed no difference in morale between teachers on varying schedules. They did show that teachers' feelings about year-round scheduling improved with experience (Palmer & Bemis, 1999). In a study of two schools in Ontario, Canada, Shields, and Oberg (2000a) found that "30 of 31 teachers who had tried the modified calendar preferred it" (¶ 31). Teachers responded that the year-round calendar "had increased their enthusiasm and motivation, improved their working environment, and decreased their job stress" (Shields & Oberg, 2000a, ¶ 31). A review of 39 studies found that students, parents, and staff that participated in a year-round calendar were positive about their experience (EPE Research Center, 2004).

Several other studies also found positive attitudes among teachers on a year-round calendar. In 2002, Dr. Michael Lowe, found that the year-round program in a New York school district created positive feelings in the students. He found that teachers felt the attitudes of students improved with the shorter, more frequent breaks. Teachers also reported that they were refreshed more of the time and had more excitement about their teaching (Lowe, 2002). Teachers at an Ohio school on a year-round calendar said that this calendar provided them with "much needed time during the school year to regroup and recharge" (Bayless, 1997, p. 19). Many teachers felt that frequent breaks during the school year helped to reduce burnout and allowed them time to visit and learn from other teachers (Inger, 1994, ¶ 18). Teachers in Fairfax County, Virginia, "viewed the year-round schedule as an improvement in their working conditions" (Metzker, 2003, p. 67). They felt that the breaks gave them more flexibility in their schedules and allowed them "systematic breaks" so that those in areas where students had more needs would not burn out so quickly (Metzker, 2003, p. 66). Teachers in San Diego, where 41 percent of the

elementary schools operated on a year-round calendar, stated that they felt there was less burnout when the year was broken up (Wildavsky, 1999, ¶ 2).

Extended School Year

History of extended school year.

> As schools across the country struggle to meet the demands of the federal No Child Left Behind Act and their state accountability systems, educators are searching for ways to raise student achievement. Increasing numbers of school and district leaders are turning to one of the most fundamental features of the public education system: the amount of time students spend in school. (Silva, 2007, p. 1)

Although many districts have been going to great lengths to reform their schools in response to this new act, the basic structure of the school year has experienced few changes (Pennington, 2006, p. 3). One change that has been taking place is an extended school year, a school calendar that has more days than the traditional school calendar (Tawasha, 1995, p. 1). Some extended school year programs are geared to special education students that would otherwise regress during the summer. For the purpose of this study, only programs offering extended services for all students were considered. Many districts have seen the addition of school days to the calendar as the only means of improving student achievement (Silva, 2007, p. 1).

The National Commission on Education Excellence released *A Nation at Risk* in the early 1980s urging educational leaders to look at three issues that included time, expectations, and content (Aronson, Zimmerman, & Carlos, 1998, p. 1). This report also contended that in order to be competitive with other countries, students in America must

spend a greater amount of time in school. In response to this report, 37 states considered extended school years over the next seven years, but most were not approved. In 2006, eight states required 175 days for a school year and thirty-four required 180 ("School Days," 2006). One model of extended school year required students to attend up to 240 days a year (Francis et al., 2004, p. 6). As O'Brien (2006 a.) noted, "It just stands to reason that more time for learning equals more being learned (¶ 1)."

Many school districts on a traditional calendar provide traditional summer school classes for students who were not successful during the school year. A large number of these programs provide remedial support to students but have low academic expectations for students. Most extended school year calendars, on the other hand, were created in an effort to improve overall student achievement while raising expectations. (Silva, 2007, p. 7).

District EP in St. Louis County, Missouri, began an extended plus program for four of their elementary schools in 1998. These schools, EP1, EP2, EP3, and EP4 Elementary schools were the district's lowest performing schools on MAP testing. The district knew that improvement was necessary in order to meet the requirements of the No Child Left Behind legislation (Farbman & Kaplan, 2005).

To meet the new national educational requirements, District EP did more than change the calendar. They also implemented new, research based programs for mathematics and reading and increased the amount of professional development for the teachers. In order to improve, the school could not continue to do the same things for more time each year; methods had to change too (Farbman & Kaplan, 2005). The district used the same curriculum for these schools as it did for the rest of the school district but

changed the method of instruction. When the extended schools were announced, all staff had to interview for positions at those schools. The district searched for teachers who wanted to work the extra days and were willing to learn and implement new methods to improve student achievement. Teachers chosen for the positions were trained extensively in the new programs before the school year began.

An extended plus program created many new expenses for the school district. District EP increased days for teachers, office staff, instructional specialists, social workers, counselors, nurses and librarians. These additions alone added up to $1,102,806 during the 1998-1999 school year. Once they added other required expenses, the total additional cost for the initial school year was projected at $1,290,806 (Ferguson-Florissant School District, 1998). The state of Missouri provided about $1.2 million for this endeavor (Bower, 1998).

Student achievement with an extended school year schedule. Behind the initiatives to lengthen the school year and/or day, according to Stoops (2007), was the belief that "additional instructional time should allow teachers to better teach material and allow students more time to learn it" (p. 1). A review of studies on the correlation between time and learning revealed little to no relationship between allocated time and student achievement. It did find, however, some connection between engaged time and student achievement and a greater correlation between time spent on academic learning and student achievement. These studies showed that time did affect student achievement when that time focused on learning activities (Aronson et a l., 1998, p. 3).

Karweit (as cited by Aronson et al., 1998) found that there was not a consistent correlation between the amount of instructional time a school provided and the amount of

time the students spent on real learning activities. Therefore, the amount of time students spent in school was not necessarily a predictor of how much time students spent engaged in learning activities (Aronson et al., p. 3). Further, he found that adding time to a school day did not improve student achievement without increasing time for students to be engaged in learning activities (Aronson et al., p. 4).

In the United States, the number of days that students are required to attend school is determined at the state level. In a study by the Indiana Department of Education, it was determined that there was a wide variance in these state requirements in regards to number of attendance days, as well as the number of hours per day and hours, per year students were required to attend. The number of required days of student attendance ranged from 160-187 in their 2001 study (Reed, 2001). Axelrad-Lentz (1996) concluded that improving student achievement required an extension of "productive learning time" (p. iv).

In search of school improvement, the San Diego Unified School District began a set of reforms including double- and triple-length English classes, extended school days, and summer school reading programs. The students in elementary school who participated in these programs showed improvement. More than ten percent of the students in the bottom tenth shifted up into higher levels in the area of reading achievement. This improvement was not seen at the high school and middle school levels (Betts, Zau, & King, 2005a). One of the most effective elements was the Extended Day Reading Program where the students who were reading below grade level received 90 minutes of reading instruction three days a week before or after school. The additional

time improved reading skills without scores in other areas suffering (Betts, Zau, & King, 2005b).

Students at New Stanley Elementary School in Kansas City, Kansas attended school 205 days a year while the teachers attended professional development an additional 21 days each year. The teams of teachers were assigned to the same students for three years at a time. Before- and after-school programs were offered to assist the working parents. All of these programs were implemented because of the district's focus on high expectations for all students. New Stanley Elementary School was a typical urban elementary school with two-thirds of the students from minority backgrounds and 75% of the students qualifying for free or reduced-price meal programs. After full implementation of the mentioned programs, the school had all exiting fifth grade students at or above grade level (Natioinal Education Commission on Time and Learning, 1994).

The Brooks Global Studies Extended-Year Magnet School in Greensboro, North Carolina, extended its school year by 30 days a year. It determined that students would have attended one extra year of school by the time they left elementary. After three years on this calendar, they saw significant increases in reading, vocabulary, mathematics, and general knowledge. They found that even students in kindergarten and first grade were scoring higher than similar students on a traditional calendar (Tawasha, 1995, ¶ 5).

A Retention Reduction Program began in 1993 in Texas after the Texas State Board of Education provided funding to address the needs of first-grade students who had not mastered the curriculum required to successfully pass first grade. The program began during the 1993-1994 school year as a pilot program and continued the next year in 53 school districts. This optional extended-year program added up to 30 additional school

days to help students attain the skills necessary for promotion to second grade. After showing success, this initiative was expanded to include students in kindergarten through eighth grade as a permanent program. The districts had to apply through the state and could not exceed 30 additional instructional days but could do this by extending the day, week or year. Only students who failed to meet the standards set to pass their grade were eligible for this program. Each year the number of schools participating in the optional extended-year program grew. The number of students meeting the requirements to pass their grades increased significantly with the implementation of this program (Brown, 2000).

Byrd (2001) suggested that student achievement could be improved by reducing the number of days for all students to 170 from the traditional 180 and providing additional days for the students needing remediation (p. 3). His 2001 plan proposed that those students performing on grade level would attend on an "intersession calendar" with frequent breaks, while those students needing assistance would attend classes during those breaks (Ballinger, 1995, p. 30). The calendar would look much like a year-round calendar with the interspersed breaks, but the school year would still run from August to May. Students would receive an education more tailored to their individual needs rather than to the needs of all as under a standard calendar (Byrd, 2001, p. 3).

A review of literature showed that most successful extended school year programs also include significant changes in the methods of instruction. Just adding time to the day did not guarantee improvement. Doing more of the same thing would not improve test scores. It was concluded that, to ensure improvement, schools had to use research based instructional strategies (Johnson & Spradlin, 2007). "Experts agree that it is of little value

to add days to the calendar without a concrete plan for using the time to enhance instruction" (Metzker, 2003, ¶ 16).

When schools in Massachusetts began extending the school day, they also added four key elements along with the extra two hours per day. These included (a) increased core academics, (b) enrichment programs, (c) individualized instruction, and (d) staff development. They found that the key to success for this program was to have "staff, parents, and community members embrace the idea of a longer school day" (Sack-Min, 2007, p. 4).

Brown and Saks (as cited in Prendergast, Spradlin, & Palozzi, 2007) studied 25 second grade classes and 21 fifth grade classes, concluding that increased time teaching reading and mathematics had a positive impact on test scores. However, they found that the scores were also influenced by other factors that could account for the difference. In addition, they determined that the students with the lowest level of initial knowledge benefited the most from the additional instructional time (as cited in Prendergast et al., p. 2).

Using a study of third grade Illinois public school students from 1994 to 1997, Coates concluded that an increase in mathematics and English instruction led to higher test scores. He also found that increasing time in social studies instruction improved test scores in reading and writing, but lowered scores in mathematics. It was also determined that increased instruction in science did not impact scores in any of the above mentioned areas. One other determination of this study was that increased class size lowered any positive impact of the extended time (Prendergast et al., 2007, p. 2).

Studies of the effect of instructional time on test results showed that when it came to time, more was not always better (Stoops, 2007, p. 2). Stoops looked at the countries that performed best and worst in mathematics and found that their rankings did not always correlate with the number of hours in class. As illustrated in Table 2, those countries scoring at the lower end of the rankings did not necessarily have fewer hours of mathematics instruction (Stoops, p. 3)

Table 2

Instructional Time and Mathematics Performances

Rank	Country	PISA Mathematics Average Scale Score	Hours per week	Hours per year
1	Hong Kong/China	550	5.0	177
2	Finland	544	3.0	114
3	South Korea	542	6.2	221
4	Netherlands	538	2.9	110
5	Liechtenstein	536	3.8	148
27	United States	483	4.7	149
35	Uruguay	422	3.3	112
36	Thailand	417	4.5	179
37	Mexico	385	8.1	194
38	Tunisia	359	5.1	163
39	Brazil	356	4.6	187

Note: From “Better Instruction, Not More Time,” by T. Stoops, 2007, The John Locke Foundation.

Baker, Fabrega, Galindo, and Mishook (2004) sought to clarify the research on the correlation between instructional time and student achievement. According to the data,

> Students attending mathematics class for five hours or more during the week score 481 on achievement tests, while students who receive less than two hours of mathematics per week score on average of 485. About 90% of the students receive between two and five hours of mathematics class and they get on average 491 points on the mathematics achievement test. Evidently, more hours of mathematics class does not result in better achievement scores cross-nationally. (Baker et al., p. 322)

According to several studies, simply more time in the classroom did not correlate to higher student achievement. O'Brien (2006b) found that the key to improving student achievement seemed to rest on how that time was used. For time to affect student achievement in a positive way, students needed to spend more time actively engaged in learning activities. O'Brien's (2006b) research showed "little relationship between allocated time and student achievement . . . [but a] . . . larger relationship between academic learning time and achievement" (p. 1).

Family impact of extended school year schedule. The additional time at school on an extended school year calendar substantially shortens the students' summer, limiting the time available for family vacations and events. According to J. A. Clay (personal communication, June 13, 2008), principal at EP2 Elementary School in District EP, many parents were skeptical about the program at the time of implementation of the extended school year. Some parents spoke out about the extended year, while others requested that

their students attend another elementary school. Many voiced concerns that their students would miss attending summer camps, swimming, and other summer activities. Once the extended school year began, parents' attitudes changed. Some that left to avoid the extended calendar came back because of the success they saw in student achievement. Parents found ways to still have vacation and found that their children were not sitting around bored or getting in trouble during the summer. Instead, they were in school learning.

Parent, student and teacher attitudes of an extended school year schedule. Students and teachers had a variety of attitudes regarding an extended school year calendar. When changing to such a calendar, students worried that they would lose time for what was important to them–jobs, sports, extracurricular activities, and family activities. Many teachers worried that the additional time would be a disruption to their family and make it more difficult for them to advance their education (Hopkins, 1998, ¶ 26). A study in 1996 of Michigan's extended school year programs showed that, once implemented, "Teachers' attitudes towards their profession generally improved" (Axelrad-Lentz, 1996, p. 66). Burnout, however, seemed to be higher for the teachers on an extended year calendar and some were less eager to return at the beginning of the next year (Axelrad-Lentz, 1996, p. 67).

Student attitudes seemed to vary after two years of an extended calendar. Some were unhappy because they were in school when their friends in other schools were not (Axelrad-Lentz, 1996, p. 72). Students who were successful in school were more likely to have a positive attitude about the extended year (Axelrad-Lentz, 1996, p. 73).

Parents of students attending extended school year programs in the Detroit Public Schools in Michigan were surveyed. These surveys showed that 85% of parents felt the program helped improve their child's academic achievement, and most agreed that students needed to be in school more time. With this in mind, only 77% of the parents said they would want their students to be in the extended program the next year. They cited interference with family vacation time and activities as a main reason for this decision. Other comments from Detroit's parent survey included the thought that when students were at school, they were not in the neighborhood getting in trouble and that students in need of more help had more time to grasp the concepts (Johnson, 1997).

Summary

A great deal of debate continues on the topic of students attending school on an alternative calendar. Results of studies are mixed, but none show a negative impact of either alternative calendar (year-round or extended year) on the students. Although a year-round calendar could be more expensive if run on a single-track, it could also save money if run on a multi-track. Academic achievement of students attending a year-round calendar was the same or better than academic achievement on a traditional calendar. Extended school year, on the other hand, seemed to show more success. Students attending the programs showed some improvement on standardized tests. As Suarez, Torlone, McGrath and Clark (1991) stated, "It would appear that the key to improving achievement is to increase actual learning time" (p. 8). Simply increasing the amount of time a student spent in a classroom would not necessarily increase student achievement.

CHAPTER THREE – METHOD

The purpose of this study was twofold: to compare the academic achievement of students on a year-round calendar to that of students on a traditional calendar and to compare the academic achievement of students attending an extended plus program to that of students attending a traditional school year. Specifically, in the first case, third grade communication arts and fourth grade mathematics scores from the MAP test for District YR, which utilized a year-round calendar, were compared to those of District TR, which utilized a traditional calendar. Similarly, in the second case, communication arts and mathematics scores from the MAP test for four elementary schools in District EP that operated an extended plus program were compared to the scores on the same tests at the other elementary schools in the district which operated on a traditional calendar. The district implemented an extended plus program at EP1, EP2, EP3, and EP4 Elementary Schools because of extremely low test scores in these schools and the lack of progress in improvement. These comparisons were used to determine the impact of a year-round calendar and an extended calendar on student achievement, testing the hypothesis that students on these alternate calendars would perform significantly better on the MAP test than the students on a traditional calendar.

Subjects

Age and grade level. The first group of subjects in this study consisted of the third and fourth grade students from District YR and District TR in St. Charles County, Missouri, from 2000 to 2004. During this time period, the state tested only third grade students in communication arts and fourth grade students in mathematics. The second group of subjects consisted of elementary students from District EP in St. Louis County,

Missouri, from 1998 to 2005. Scores were considered from all students in the third and fourth grades, as in the first group.

Ethnicity. The total enrollment in each of District YR and District TR ranged from 15,973 to 18,832 during the years 2000 to 2004. Both districts were similar in their ethnicity during those years, with minority enrollment ranging between 4.30% and 7.40%, as shown in Tables 3 and 4.

Table 3

District YR Enrollment 2000-2004

	2000	2001	2002	2003	2004
Total	18,832	18,831	18,649	18,484	18,360
Asian	0.80%	0.80%	1.20%	1.30%	1.50%
Black	2.80%	3.20%	4.10%	4.00%	4.40%
Hispanic	0.70%	0.80%	1.00%	1.10%	1.30%
Indian	1.60%	0.70%	0.50%	0.30%	0.30%
White	94.20%	94.50%	93.30%	93.20%	92.60%

Note: From Missouri Department of Elementary and Secondary Education, 2008b.

Table 4

District TR Enrollment 2000-2004

	2000	2001	2002	2003	2004
Total	15,973	16,526	17,281	17,679	18,156
Asian	0.60%	0.60%	0.80%	1.00%	1.10%
Black	2.90%	3.10%	3.40%	3.80%	4.10%
Hispanic	0.70%	1.00%	1.10%	1.30%	1.50%
Indian	0.20%	0.10%	0.10%	0.20%	0.20%
White	95.70%	95.10%	94.60%	93.80%	93.20%

Note: From Missouri Department of Elementary and Secondary Education, 2008b.

The total enrollment in District EP ranged from 11,939 students to 12,319 from 2003 to 2007, as illustrated in Tables 5 and 6. The four extended-year elementary schools in this study, EP1, EP2, EP3, and EP4, combined for an enrollment that ranged from 1,116 students to 1,295 students. The trend showed that enrollment decreased each year in these four schools while it increased in the district as a whole. The tables also illustrate a much higher percentage of black students and a lower percentage of white students in the four extended year schools than in the rest of the district.

Table 5

District EP Total Enrollment 2003-2007

	2003	2004	2005	2006	2007
Total	11,939	12,081	12,220	12,319	12,231
Asian	0.80%	0.80%	0.90%	0.80%	0.90%
Black	65.90%	68.20%	70.40%	73.10%	75.40%
Hispanic	1.10%	1.40%	1.30%	1.20%	1.10%
Indian	0.20%	0.20%	0.20%	0.20%	0.10%
White	32.00%	29.40%	27.20%	24.70%	22.60%

Note: From Missouri Department of Elementary and Secondary Education, 2008b.

Table 6

EP1, EP2, EP3, and EP4 Elementary Schools Combined Enrollment 2003-2007

	2003	2004	2005	2006	2007
Total	1295	1274	1220	1178	1116
Asian	0.39%	0.55%	0.49%	0.42%	0.36%
Black	92.59%	92.46%	93.69%	93.89%	93.46%
Hispanic	0.31%	0.39%	0.25%	0.68%	0.63%
Indian	0.31%	0.24%	0.16%	0.08%	0%
White	6.41%	6.36%	5.41%	4.92%	5.56%

Note: From Missouri Department of Elementary and Secondary Education, 2008b.

Socioeconomic status. Both District YR and District TR had fewer students eligible for free and reduced lunches than the state average, indicating their relatively high socioeconomic status. Between 2000 and 2004, District TR had a higher percentage of students on free or reduced lunch than District YR. However, the gap between the two districts closed during the last few years of the study, as evidenced by Table 7.

Table 7

Percentage of students eligible for free or reduced-price lunch

	2000	2001	2002	2003	2004
Missouri					
Percent	36.6%	37.0%	37.9%	39.4%	40.7%
Number	318,556	321,303	329,716	342,608	353,790
District YR					
Percent	5.00%	5.70%	5.90%	6.40%	8.10%
Number	902	1,066	1,089	1,174	1,476
District TR					
Percent	10.00%	9.30%	9.50%	10.00%	10.50%
Number	1,541	1,481	1,573	1,701	1,833

Note: From Missouri Department of Elementary and Secondary Education, 2008b.

The percentage of students eligible for free or reduced-price meals was much higher than the state average in District EP, during the study period. The four extended-year elementary schools in this study were even higher than the district average, indicating a

very low socioeconomic status among the students in these schools, as illustrated in Table 8.

Table 8

District EP Percentage of Students Eligible for Free or Reduced-Price Lunch

	2003	2004	2005	2006	2007
District EP	51.8%	54.3%	57.0%	58.5%	60.3%
EP1	88.2%	81.4%	90.5%	90.2%	91.3%
EP2	84.3%	83.7%	84.8%	86.9%	82.7%
EP3	88.7%	89.3%	92.4%	89.1%	90.1%
EP4	73.2%	70.0%	73.3%	75.5%	75.9%

Note: From Missouri Department of Elementary and Secondary Education, 2008b.

Student attendance. Student attendance in both District YR and District TR was above the state average and similar each year, as illustrated in the Table 9.

Table 9

Student Rates of Attendance 2000-2004

	2000	2001	2002	2003	2004
Missouri	93.6	93.7	93.9	93.7	93.6
District YR	95.3	93.5	94.3	94.7	95.2
District TR	94.1	94.2	94.3	94.7	95.1

Note: From Missouri Department of Elementary and Secondary Education, 2008b.

The attendance rate in District EP was only slightly below the state average. As illustrated in Table 10, the four elementary extended year schools had a variety of attendance rates. EP2 and EP4 Elementary Schools had a higher attendance rate than the district as a whole.

Table 10

District EP Student Rates of Attendance 2004-2007

	2004	2005	2006	2007
District EP	93	94	93	94
EP1	93.7	93.5	93.9	93.8
EP2	94.9	94.2	95.2	95.3
EP3	92.9	93.2	92.1	93.7
EP4	94.6	95.0	94.7	95.1

Note: From Missouri Department of Elementary and Secondary Education, 2008b.

Geographical location. District YR and District TR are both located in a suburban area of St. Charles County, Missouri, which is on the western edge of the metropolitan St. Louis area, approximately 30 miles west of the city limits. School District EP is located in a suburban area on the northern side of the City of St. Louis in St. Louis County, Missouri.

District information. District YR had three high schools, five middle schools and ten elementary schools in 2004, with a total enrollment of 18,360 students. District TR had three high schools, four middle schools, and fifteen elementary schools in 2004. The total enrollment of the district at that time was 18,156 students. In 2004, District EP had three high schools, three middle schools, and eighteen elementary schools. The total district enrollment was 11,949, with 1,274 attending the four elementary schools on an extended calendar.

Staffing ratios. The student to teacher ratios in District YR and District TR were similar and slightly above the state average, as illustrated in Table 11. The four elementary schools from District EP maintained a student to teacher ratio equal to or lower than the district ratio throughout the four years mentioned, with the majority being below the district and most below the state average (see Table 12).

Table 11

District YR and District TR Staffing Ratios 2000-2004

	2000	2001	2002	2003	2004
Missouri					
Students to all teachers	14	14	14	13	14
Students to classroom teachers	19	19	18	18	19
District YR					
Students to all teachers	15	16	16	15	15
Students to classroom teachers	20	22	22	21	22
District TR					
Students to all teachers	16	16	16	16	17
Students to classroom teachers	21	21	21	21	21

Note: From Missouri Department of Elementary and Secondary Education, 2008b.

Table 12

District EP Staffing Ratios 2004-2007

	2004	2005	2006	2007
District EP				
Students to all teachers	15	15	15	15
Students to classroom teachers	18	18	17	17
EP1				
Students to all teachers	14	14	13	14
Students to classroom teachers	17	18	17	18
EP2				
Students to all teachers	14	15	14	15
Students to classroom teachers	17	17	20	17
EP3				
Students to all teachers	15	15	14	13
Students to classroom teachers	17	18	17	19
EP4				
Students to all teachers	14	12	11	12
Students to classroom teachers	18	14	15	14

Note: From Missouri Department of Elementary and Secondary Education, 2008b.

Disciplinary actions. In 2004, District TR had twice as many disciplinary actions per 100 students as District YR, with District TR above the state average and District YR below it, as illustrated by Table 13. District EP was above the state average for disciplinary actions.

Table 13

2004 Disciplinary Actions

	Incident Rate per 100 Students
Missouri	1.6
District YR	1.1
District TR	2.2
District EP	2.1

Note: From Missouri Department of Elementary and Secondary Education, 2008b.

Average per pupil expenditures. District YR spent more per student than District TR every year between 2000 and 2004 except 2001. According to Table 14, both districts spent less than the state average per pupil. District EP spent $8543.25 per pupil in 2003 and 2004, which was more than the state average.

Table 14

Average Per Pupil Expenditures

	2000	2001	2002	2003	2004
Missouri	$6,303	$6,767	$7,146	$7,434	$7,394
District YR	$6,360.80	$5,951.40	$6,276.51	$7,046.92	$7,243.96
District TR	$5,717.83	$6,077.21	$6,149.57	$6,413.07	$6,294.62
District EP	N/A	N/A	N/A	$8,831.87	$8,543.25

Note: From Missouri Department of Elementary and Secondary Education, 2008b.

External Validity

This study looked at the test scores of approximately 6,900 third grade students and 7,100 fourth grade students from District YR as well as approximately 6,600 third grade students and 6,700 fourth grade students from District TR over a five-year period. In addition, 4,419 third grade students and 4,665 fourth grade students from District EP elementary schools were studied. This included 896 third grade students and 1,489 fourth grade students from the four elementary schools on the extended year calendar. Due to the number of students and length of time involved in this study, it is reasonable to believe that these results could be generalized to other school districts with demographics similar to those discussed in preceding sections of this study.

Research Design

In this Causal-Comparative study, existing information, available to the public, was accessed from the Missouri Department of Education web site. No new situations were created in the completion of this ex post facto research. Four groups of students were involved in this Static-Group Comparison study: those on a year-round calendar, those on an extended calendar, and two groups on traditional calendars. The MAP testing considered in this study had already been completed and the results had been published before this study began.

Instrumentation

The instrument used during this research was the MAP test, the standardized test used by the State of Missouri to determine the academic achievement of its students. Every public school district in the state is required to administer the MAP to students in designated grades. During the period of this study of District YR and District TR, all third grade students were tested in the area of communication arts and all fourth grade students were tested in the area of mathematics. In 2006, changes were made in the scoring and administration of the test. Since then, all elementary students in third through fifth grades have been required to take both the communication arts and mathematics tests each year. Also, prior to 2006, the scores were classified in quintiles; however, in 2006, this changed to quartiles.

Reliability

Reliability of scores is determined on a range from zero to one, with the higher being more dependable. The reliability coefficient for the MAP assessments fell between .913 and .921 for fourth grade mathematics and third grade communication arts, as

illustrated in Table 15. These high coefficients indicate a high degree of confidence in the MAP scale scores, as explained by the Missouri Department of Elementary and Secondary Education:

> The reliability of raw scores on the MAP tests was evaluated using Cronbach's (1951), Alpha, which is a lower-bound estimate of test reliability. The reliability coefficient is a ratio of the variance of true test scores to those of the observed scores, with the values ranging from 0 to 1. The closer the value of the reliability coefficient is to 1, the more consistent the scores, where 1.00 refers to a perfectly consistent test. As a rule of thumb, reliability coefficients that are equal to or greater than 0.9 are considered acceptable for tests of lengths similar to the MAP. (2008a)

Table 15

MAP Scale Score Reliability Coefficients

	1997	1998	1999	2000
Grade 4 Mathematics	.919	.921	.915	.913
Grade 3 Communication Arts	N/A	.920	.915	.913

Note: From Missouri Department of Elementary and Secondary Education, 2008b.

When comparing the MAP to other educational assessments, the high reliability coefficients are still prevalent. When compared to the SAT I, the verbal coefficients were .91 to .93 and the mathematics coefficients were .92 to .93. Similarly, when compared to

the ACT Assessment, the English coefficients were .90 to .91 and the mathematics coefficients were .89 to .94. With these comparisons, it is reasonable to determine that the reliability of the MAP is very high.

Validity

The Missouri Department of Elementary and Secondary Education (2008b) ensured the validity of the MAP scores. Methodical procedures were used in creating these tests. Content experts created questions aligned to the required standards for each grade level. Then groups of Missouri educators reviewed the items to verify that each question measured the content or process it was intended to assess. The multiple layers of review were evidence for the content validity of the MAP scores.

Procedure

Before gathering statistical information, written consent was obtained from the superintendents of all three school districts, District YR, District TR, and District EP, to use publicly released MAP data (See Appendix A, B, C). The first step in completing this study was to access the MAP data for District YR, District TR, and District EP on the Missouri Department of Education web site. This information is available with detail to the public. Next, MAP scores from District YR and District TR were compared. Finally, MAP scores from the four extended year elementary schools in District EP were compared to the rest of the elementary schools in the district. Student demographics and district enrollment statistics were also included.

Summary

This causal-comparative study compared student scores on a standardized state test in three school districts that used different school year calendars. The purpose was to

determine the impact of those calendars on student achievement. The groups and time frames studied were selected so as to limit the effects of demographics and changes in state statistical record keeping.

Specifically, third grade communication arts scores and fourth grade mathematics scores on the MAP test from a district using a traditional calendar, District TR, were compared to scores from a district using a year-round calendar, District YR. A second part of the study compared third and fourth grade MAP scores within a district, the District EP, where a group of four of its schools in this district was changed to an extended plus program, while the rest of the district remained on a traditional calendar.

CHAPTER FOUR - RESULTS

The purpose of this study was focused on the effects of a year-round calendar and an extended plus program on student achievement. For the first part of this study, scores in communication arts and mathematics on the MAP test were compared for third and fourth grade students from each of two demographically similar school districts in order to consider the effects of the year-round calendar. The second part of this study compared MAP scores within a single district. While most of the elementary schools in this district used a traditional school calendar, four of its eighteen elementary schools operated on an extended year calendar. The hypotheses were that students who attended school on a year-round calendar or an extended plus program would have MAP scores that were significantly higher than those of students who attended school on a traditional calendar.

Results for Year-Round Schedules

The hypothesis for this study was tested using a Chi-Square Test of Independence. MAP test scores in communication arts and mathematics were obtained from both District YR and District TR over a period of five years. The hypothesis of independence of results was tested for each year's set of scores from the two districts. The Chi-Square analysis for each year follows.

2001 results. In the area of communication arts,

> H_0 (null hypothesis): Test results from students attending schools utilizing a year-round calendar were independent of test results of students attending schools with traditional calendars. If the p-value was greater than .05, then this hypothesis was true, and there was no significant difference in the values tested.

H_1: Test results from students attending schools utilizing a year-round calendar were not independent of test results of students attending schools with traditional calendars. If the p-value was less than .05, then H_o was not accepted, H_1 was true, and there was a significant difference between the values tested.

x^2 (4, $\underline{N}$=2,833) = 10.725, $\underline{p}$=.0298

This p-value was less than .05, so the null hypothesis (H_0) was not accepted. Therefore, the alternative was true: there was a significant difference between the scores for each type of school calendar. In this case, the scores on the communication arts test were significantly higher in District YR. Table 16 and corresponding Figure 1 illustrate the percentage of students scoring in each quintile on the MAP test for both districts. As seen in these charts, District YR had a higher percentage of students in the Proficient and Advanced quintiles and a lower percentage of students in the Progressing and Nearing Proficient quintiles. District TR had a lower percentage of students in the Step One Quintile, which is desirable.

Table 16

Percent of Students Scoring in Each Quintile on the 2001 Communication Arts MAP Test

	Step 1	Progressing	Nearing Proficient	Proficient	Advanced
YR	5.5	16.7	39.5	37.1	1.2
TR	3.4	18.5	42.0	35.2	0.9

Note: From Missouri Department of Elementary and Secondary Education, 2008b.

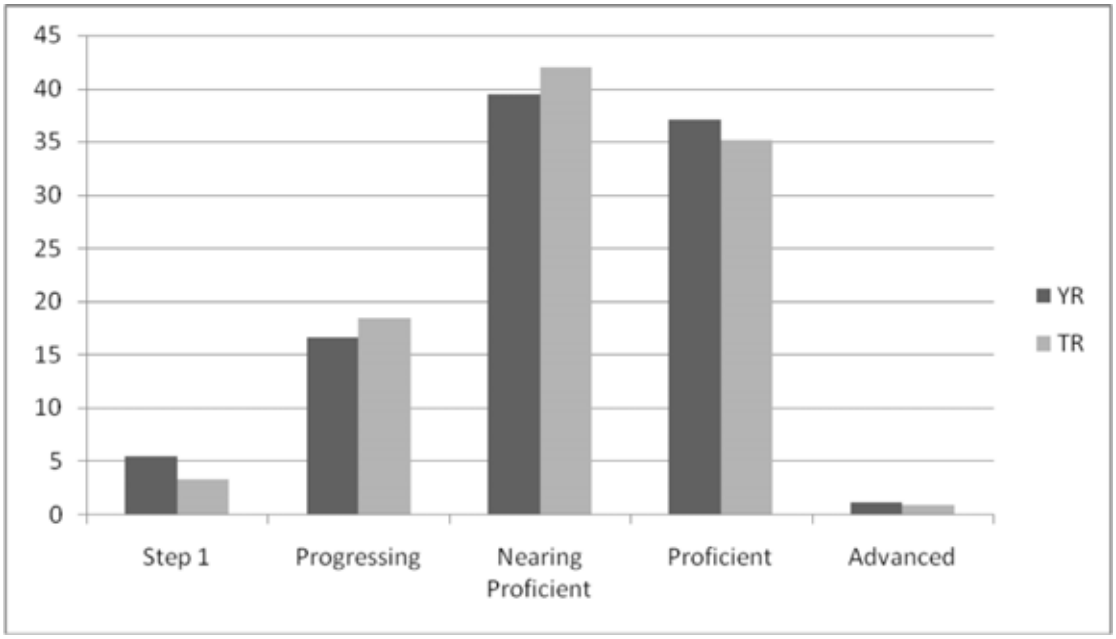

Figure 1. 2001 District YR and District TR Communication Arts MAP Scores

Note. From Missouri Department of Elementary and Secondary Education, 2008b.

In the area of mathematics,

H_0: Test results from students attending schools utilizing a year-round calendar were independent of test results of students attending schools with traditional calendars.

H_1: Test results from students attending schools utilizing a year-round calendar were not independent of test results of students attending schools with traditional calendars.

x^2 (4, $\underline{N}$=2,778) = 2.869, $\underline{p}$=.58

This p-value was greater than .05, so the null hypothesis (H_0) was accepted. Therefore, there was not a significant difference between the scores for each type of school calendar. Table17 and Figure 2 illustrate the percentage of students scoring in

each quintile on the MAP test for both districts. District TR had a higher percentage of students in the Nearing Proficient quintile and District YR had a higher percentage of students in the Proficient and Advanced quintile, but about the same number in the other quintiles.

Table 17

Percent of Students Scoring in Each Quintile on the 2001 Mathematics MAP Test

	Step 1	Progressing	Nearing Proficient	Proficient	Advanced
YR	1.6	15.1	41.4	33.2	8.7
TR	1.5	15.1	44.3	31.4	7.7

Note: From Missouri Department of Elementary and Secondary Education, 2008b.

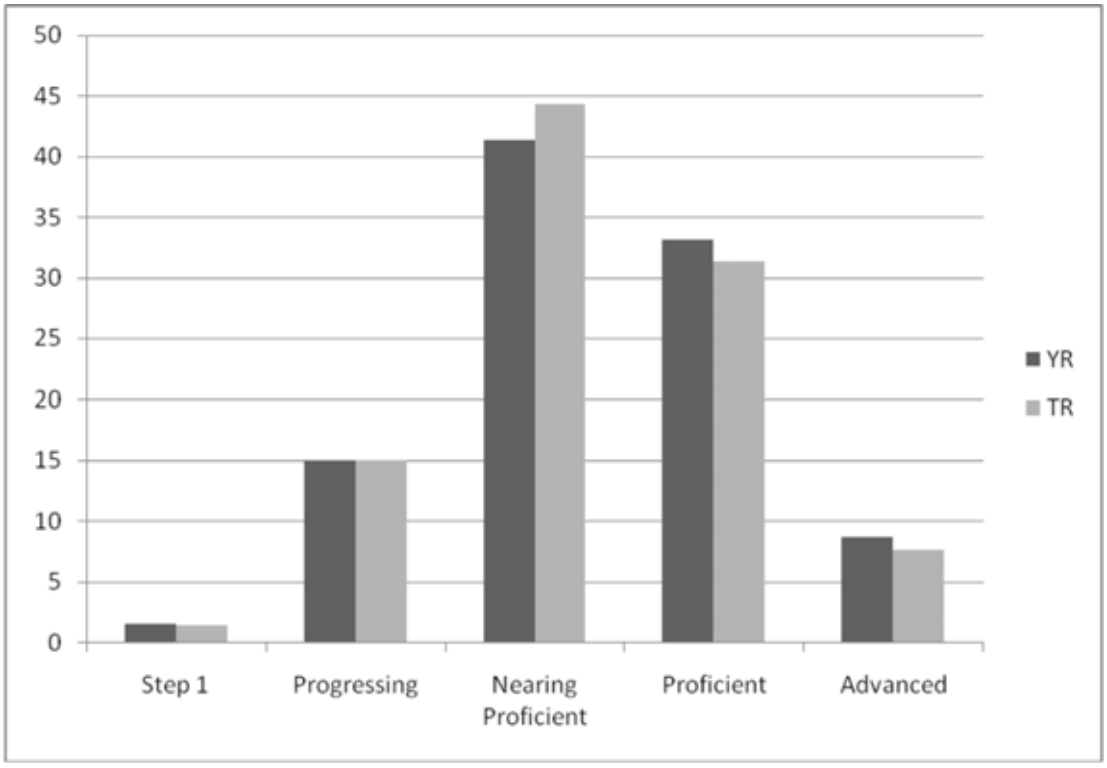

Figure 2. 2001 District YR and District TR Mathematics MAP Scores

Note: From Missouri Department of Elementary and Secondary Education, 2008.

2002 results. In the area of communication arts,

H_0: Test results from students attending schools utilizing a year-round calendar were independent of test results of students attending schools with traditional calendars.

H_1: Test results from students attending schools utilizing a year-round calendar were not independent of test results of students attending schools with traditional calendars.

$x^2(4, \underline{N}=2{,}753) = 11.156, \underline{p}=.0249$

This p-value was less than .05, so the null hypothesis (H_0) was not accepted. Therefore, the alternative was true: there was a significant difference between the scores

for each type of school calendar. In this case, the scores on the communication arts test were significantly higher in District TR. Table 18 and corresponding Figure 3 illustrate the percentage of students scoring in each quintile on the MAP test for both school districts. District TR had a higher percentage of students in the Progressing, Proficient and Advanced quintiles and a lower percentage of students in the Step One and Nearing Proficient quintiles than District YR.

Table 18

Percent of Students Scoring in Each Quintile on the 2002 Communication Arts MAP Test

	Step 1	Progressing	Nearing Proficient	Proficient	Advanced
YR	4.9	16.0	41.8	35.3	2.0
TR	3.2	18.5	38.7	36.8	2.8

Note. From Missouri Department of Elementary and Secondary Education, 2008b.

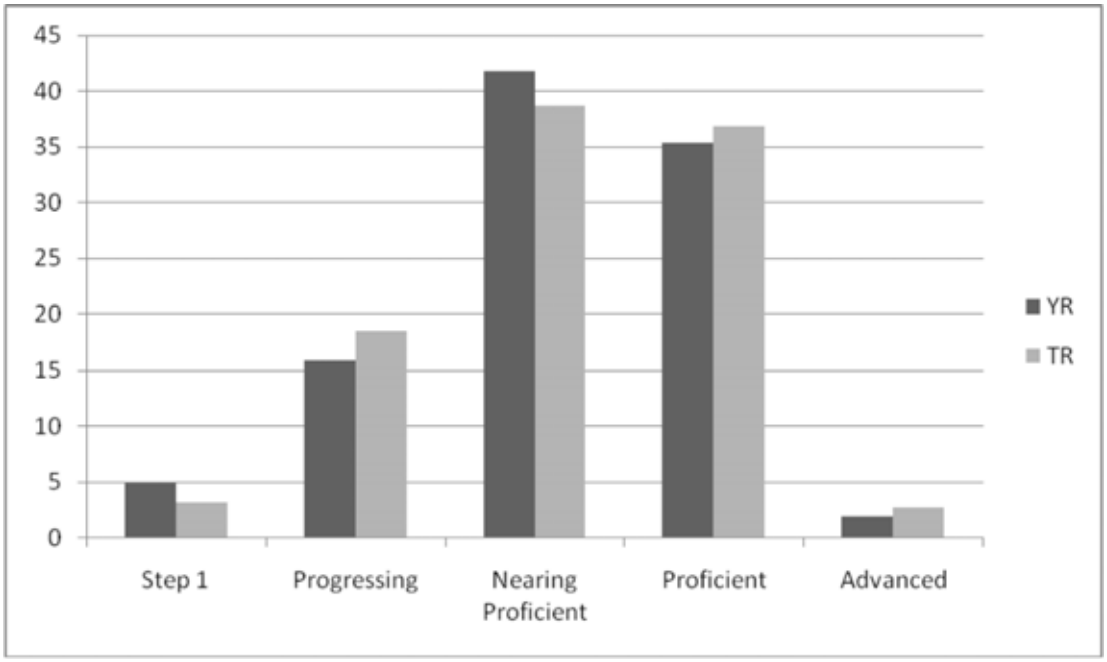

Figure 3. 2002 District YR and District TR Communication Arts MAP Scores

Note. From Missouri Department of Elementary and Secondary Education, 2008b.

In the area of mathematics,

H_0: Test results from students attending schools utilizing a year-round calendar were independent of test results of students attending schools with traditional calendars.

H_1: Test results from students attending schools utilizing a year-round calendar were not independent of test results of students attending schools with traditional calendars.

$x^2(4, \underline{N}=2{,}898) = 16.568, \underline{p}=.0023$

This p-value was less than .05, so the null hypothesis (H_0) was not accepted. Therefore, the alternative was true: there was a significant difference between the scores for each type of school calendar. In this case, the scores on the mathematics test were

significantly higher for District YR. Table 19 and corresponding Figure 4 illustrate the percentage of students scoring in each quintile on the MAP test for both school districts. District YR had a higher percentage of students in the Proficient and Advanced quintiles and a lower percentage of students in the Nearing Proficient and Progressing quintiles than District TR. The two districts had a similar percentage of students score in the Step One quintile.

Table 19

Percent of Students Scoring in Each Quintile on the 2002 Mathematics MAP Test

	Step 1	Progressing	Nearing Proficient	Proficient	Advanced
YR	1.5	12.5	40.2	36.7	9.1
TR	1.3	16.2	43.3	31.8	7.4

Note. From Missouri Department of Elementary and Secondary Education, 2008b.

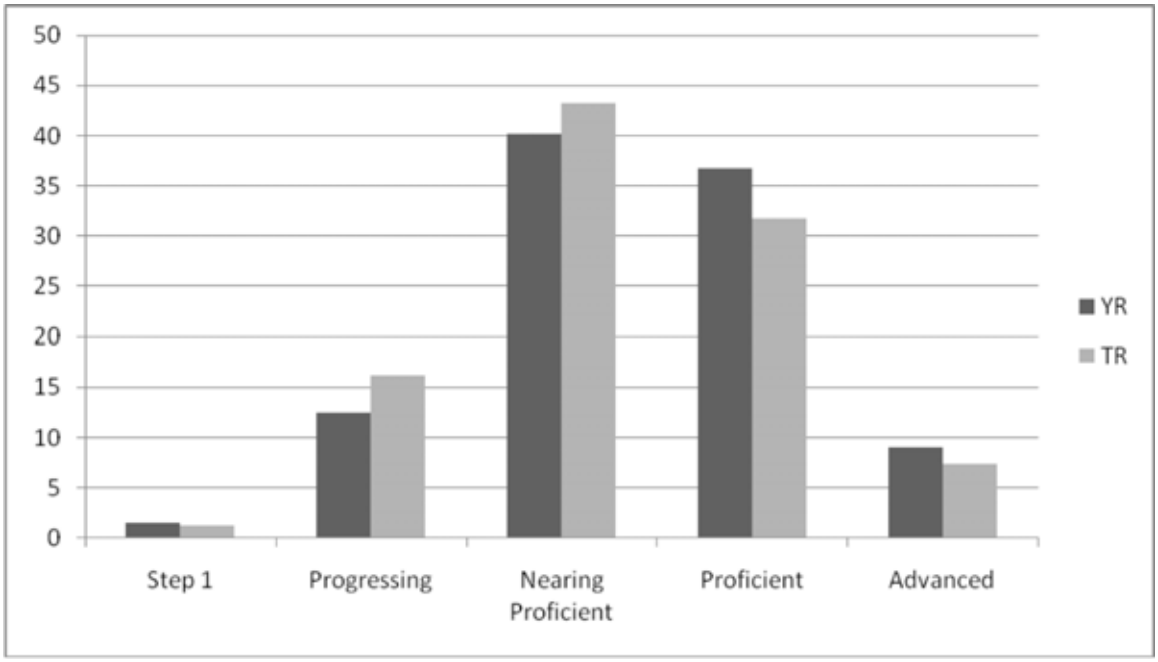

Figure 4. 2002 District YR and District TR Mathematics MAP Scores

Note. From Missouri Department of Elementary and Secondary Education, 2008b.

2003 results. In the area of communication arts,

H_0: Test results from students attending schools utilizing a year-round calendar were independent of test results of students attending schools with traditional calendars.

H_1: Test results from students attending schools utilizing a year-round calendar were not independent of test results of students attending schools with traditional calendars.

$x^2(4, \underline{N}=2{,}552) = 7.705, \underline{p}=.1030$

This p-value was greater than .05, so the null hypothesis (H_0) was accepted. Therefore, there was not a significant difference between the scores for each type of school calendar. Table 20 and Figure 5 illustrate the percentage of students scoring in

each quintile on the MAP test for both school districts. District TR had a higher percentage of students score in the Step One, Nearing Proficient, Proficient and Advanced quintiles while District YR had a higher percentage of students score in the Progressing quintile.

Table 20

Percent of Students Scoring in Each Quintile on the 2003 Communication Arts MAP Test

	Step 1	Progressing	Nearing Proficient	Proficient	Advanced
YR	4.4	17.6	40.8	36.5	0.7
TR	4.6	14.8	41.0	38.0	1.6

Note. From Missouri Department of Elementary and Secondary Education, 2008b.

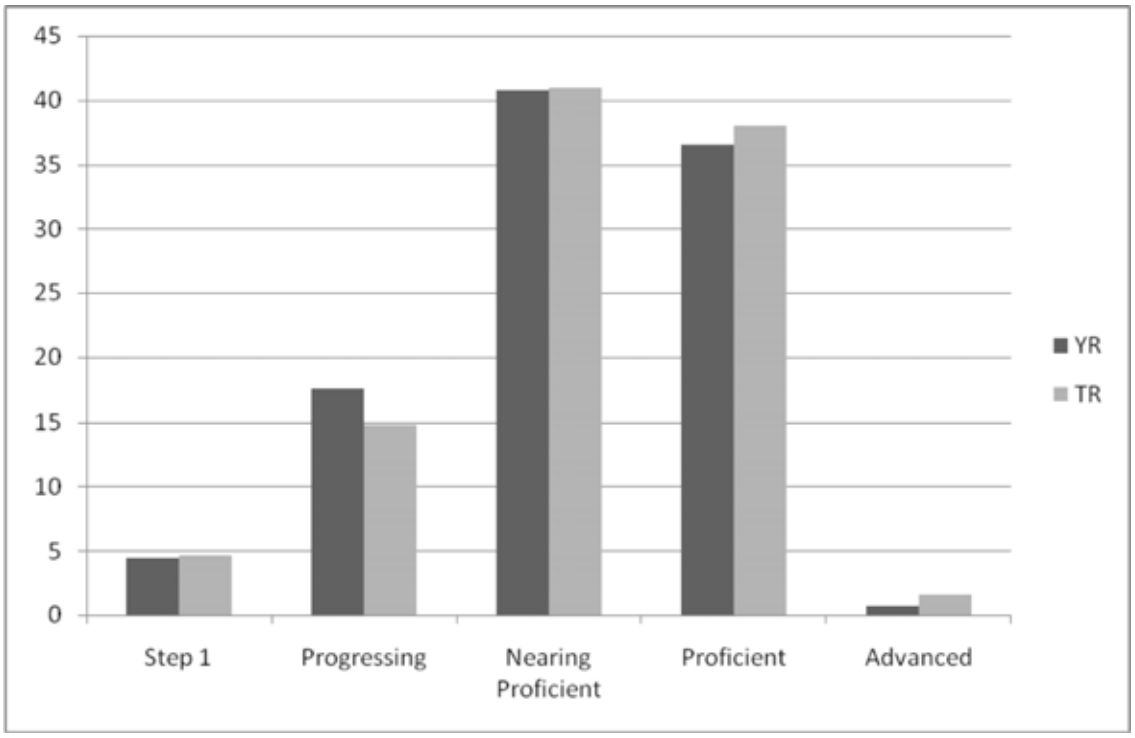

Figure 5. 2003 District YR and District TR Communication Arts MAP Scores

Note. From Missouri Department of Elementary and Secondary Education, 2008b.

In the area of mathematics,

H_0: Test results from students attending schools utilizing a year-round calendar were independent of test results of students attending schools with traditional calendars.

H_1: Test results from students attending schools utilizing a year-round calendar were not independent of test results of students attending schools with traditional calendars.

$x^2(4, \underline{N}=2{,}781) = 4.315, \underline{p}= .3651$

This p-value was greater than .05, so the null hypothesis (H_0) was accepted. Therefore, there was not a significant difference between the scores for each type of

school calendar. Table 21 and Figure 6 illustrate the percentage of students scoring in each quintile on the MAP test for both school districts. The percentage of students in each quintile was very similar, with a higher percentage of students from District YR scoring in the areas of Progressing and Nearing Proficient and a higher percentage of District TR students scoring Proficient and Advanced.

Table 21

Percent of Students Scoring in Each Quintile on the 2003 Mathematics MAP Test

	Step 1	Progressing	Nearing Proficient	Proficient	Advanced
YR	0.9	14.3	45.6	33.1	6.1
TR	0.9	12.5	43.9	36.1	6.6

Note. From Missouri Department of Elementary and Secondary Education, 2008b.

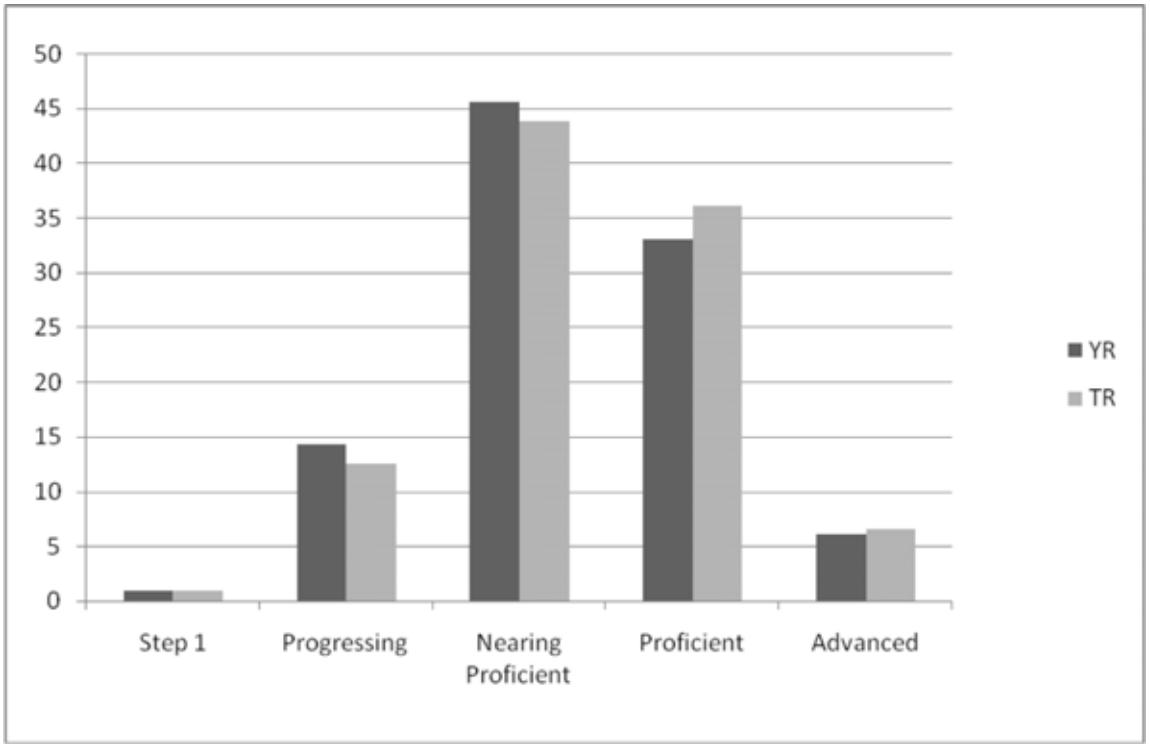

Figure 6. 2003 District YR and District TR Mathematics MAP Scores

Note. From Missouri Department of Elementary and Secondary Education, 2008b.

2004 results.

H_0: Test results from students attending schools utilizing a year-round calendar were independent of test results of students attending schools with traditional calendars.

H_1: Test results from students attending schools utilizing a year-round calendar were not independent of test results of students attending schools with traditional calendars.

$x^2(4, \underline{N}= 2{,}660) = 24.234, \underline{p}= .0001$

This p-value was less than .05, so the null hypothesis (H_0) was not accepted. Therefore, the alternative was true: there was a significant difference between the scores

for each type of school calendar. In this case, the scores on the communication arts test were significantly higher in District TR. Table 22 and corresponding Figure 7 illustrate the percentage of students scoring in each quintile on the MAP test for both districts. District TR had a higher percentage of students score in the Proficient and Advanced quintiles and a lower percentage of students score in the Step One, Progressing, and Nearing Proficient quintiles than District YR.

Table 22

Percent of Students Scoring in Each Quintile on the 2004 Communication Arts MAP Test

	Step 1	Progressing	Nearing Proficient	Proficient	Advanced
YR	6.0	18.0	42.5	32.6	0.9
TR	3.4	14.9	41.0	39.3	1.4

Note. From Missouri Department of Elementary and Secondary Education, 2008b.

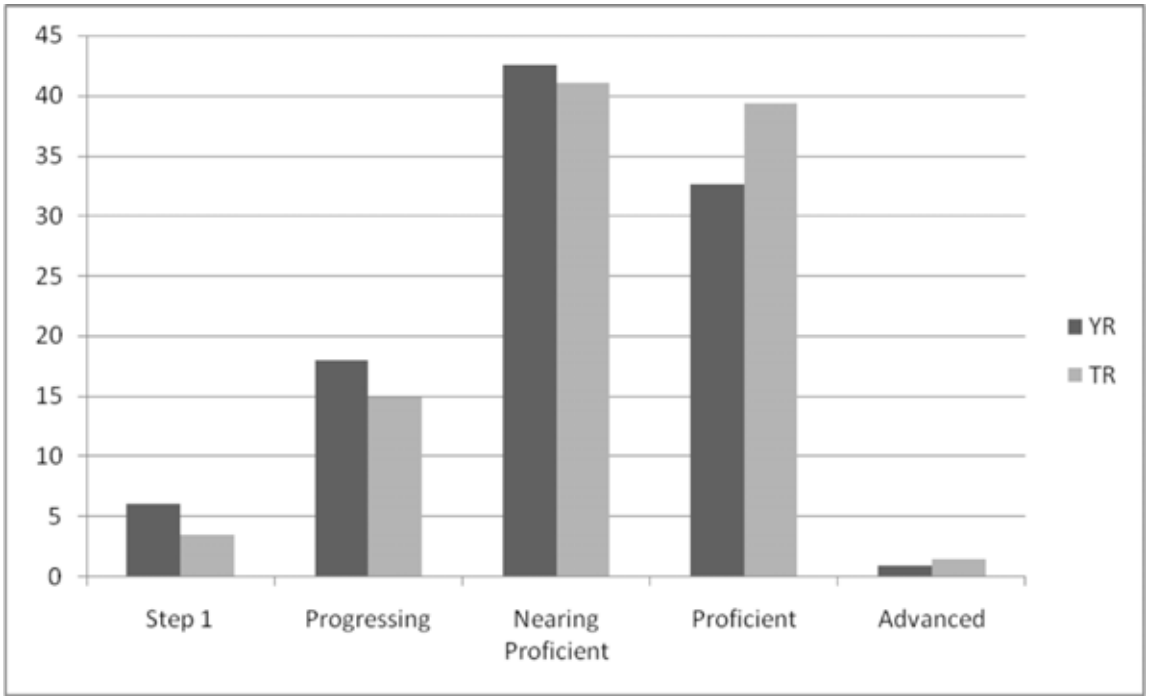

Figure 7. 2004 District YR and District TR Communication Arts MAP Scores

Note. From Missouri Department of Elementary and Secondary Education, 2008b.

In the area of mathematics,

H_0: Test results from students attending schools utilizing a year-round calendar were independent of test results of students attending schools with traditional calendars.

H_1: Test results from students attending schools utilizing a year-round calendar were not independent of test results of students attending schools with traditional calendars.

$x^2(4, \underline{N}=2{,}604) = 5.518, \underline{p}= .2382$

This p-value was greater than .05, so the null hypothesis (H_0) was accepted. Therefore, there was not a significant difference between the scores for each type of school calendar. Table 23 and a corresponding Figure 8 illustrate the percentage of

students scoring in each quintile on the MAP test for both school districts. District TR had a higher percentage of students scoring in the Step One, Proficient, and Advanced quintiles, while District YR had a higher percentage of students score in the Progressing and Nearing Proficient quintiles.

Table 23

Percent of Students Scoring in Each Quintile on the 2004 Mathematics MAP

	Step 1	Progressing	Nearing Proficient	Proficient	Advanced
YR	1.2	14.7	44.7	33.7	5.7
TR	1.4	12.8	43.3	34.9	7.6

Note. From Missouri Department of Elementary and Secondary Education, 2008b.

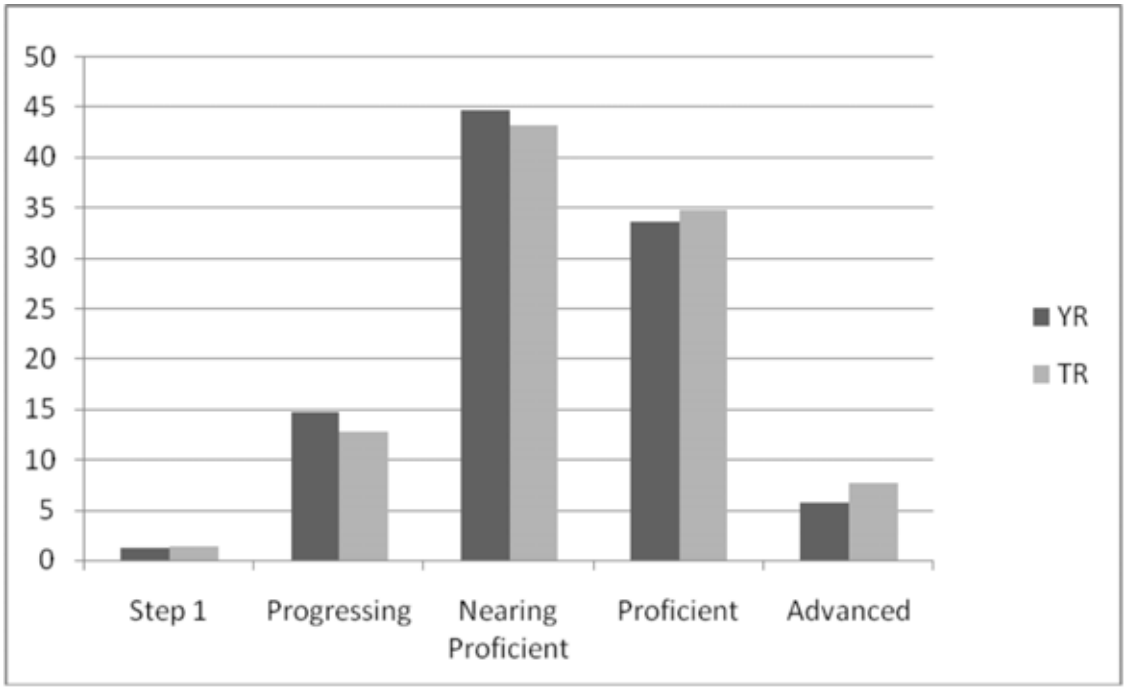

Figure 8. 2004 District YR and District TR Mathematics MAP Scores

Note. From Missouri Department of Elementary and Secondary Education, 2008b.

2005 results. In the area of communication arts,

H_0: Test results from students attending schools utilizing a year-round calendar were independent of test results of students attending schools with traditional calendars.

H_1: Test results from students attending schools utilizing a year-round calendar were not independent of test results of students attending schools with traditional calendars.

$x^2(4, \underline{N}=2{,}709) = 1.4, \underline{p}=.8442$

This p-value was greater than .05, so the null hypothesis (H_0) was accepted. Therefore, there was not a significant difference between the scores for each type of school calendar. Table 24 and Figure 9 show the percentage of students scoring in each

quintile on the MAP test for both school districts. District YR and District TR had almost the same percentage of students scoring in each quintile, with a slightly higher percentage of students from District YR scoring in Step One, Progressing, and Proficient.

Table 24

Percent of Students Scoring in Each Quintile on the 2005 Communication Arts MAP Test

	Step 1	Progressing	Nearing Proficient	Proficient	Advanced
YR	3.9	17.8	42.5	34.6	1.2
TR	3.3	17.4	43.2	34.5	1.6

Note. From Missouri Department of Elementary and Secondary Education, 2008b.

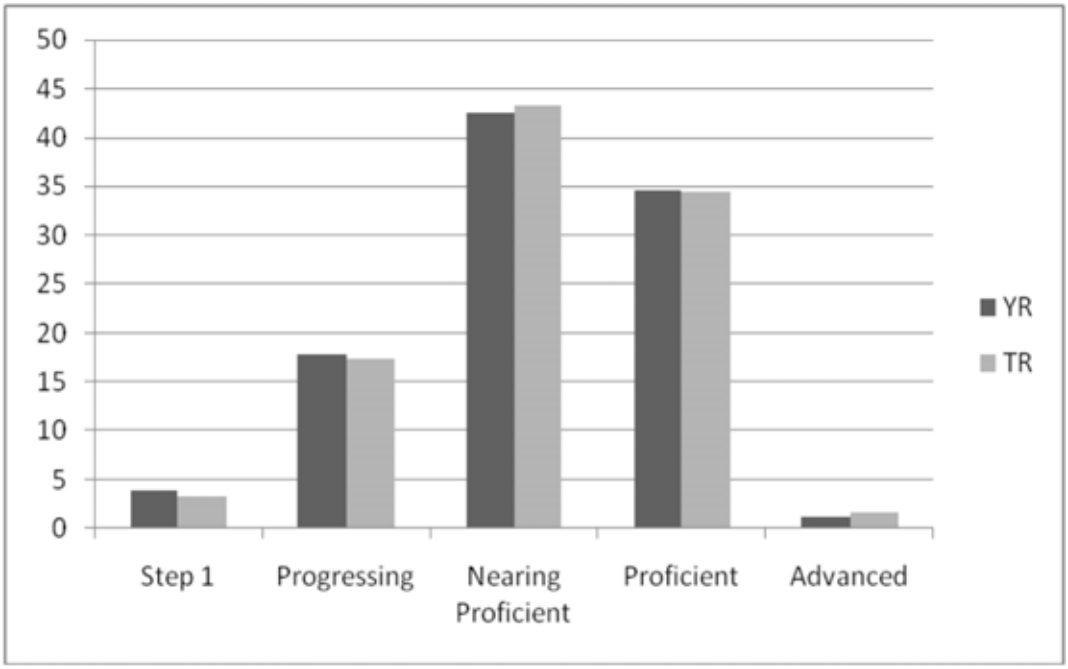

Figure 9. 2005 District YR and District TR Communication Arts MAP Scores

Note. From Missouri Department of Elementary and Secondary Education, 2008b.

In the area of mathematics,

H_0: Test results from students attending schools utilizing a year-round calendar were independent of test results of students attending schools with traditional calendars.

H_1: Test results from students attending schools utilizing a year-round calendar were not independent of test results of students attending schools with traditional calendars.

$x^2(4, \underline{N}=2{,}657) = 6.719, \underline{p}= .1515$

This p-value was greater than .05, so the null hypothesis (H_0) was accepted. Therefore, there was not a significant difference between the scores for each type of school calendar. Table 25 and Figure 10 illustrate the percentage of students scoring in each quintile on the MAP test for both school districts. A higher percentage of students from District TR scored in the Step One, Progressing, Nearing Proficient, and Advanced quintiles. A higher percentage of students from District YR scored in the Proficient quintile.

Table 25

Percent of Students Scoring in Each Quintile on the 2005 Mathematics MAP Test

	Step 1	Progressing	Nearing Proficient	Proficient	Advanced
YR	0.8	10.6	41.9	39.7	7.0
TR	1.4	11.5	43.5	35.7	7.8

Note. From Missouri Department of Elementary and Secondary Education, 2008b.

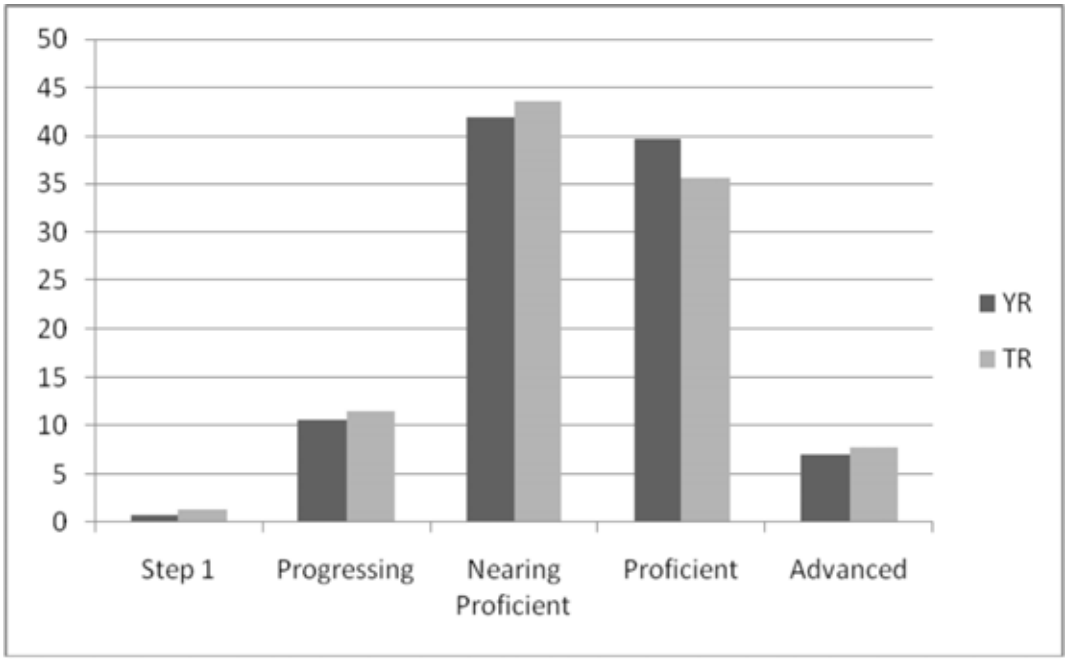

Figure 10. 2005 District YR and District TR Mathematics MAP Scores

Note. From Missouri Department of Elementary and Secondary Education, 2008b.

Results for Extended Plus

The second hypothesis for this study was tested using a Chi-Square Test of Independence. Scores on the MAP test were obtained from District EP for a period of nine years in both communication arts and mathematics. The scores were divided into two groups: one from four elementary schools that operated an extended plus program, and the second from all the other elementary schools in the district, which operated on traditional school year calendars. In each case, the hypothesis of independence of results was tested. The Chi-Square analysis for each year follows.

2001 results. In the area of communication arts,

H_0: Test results from students attending schools utilizing the extended plus calendar were independent of test results of students attending schools with traditional calendars.

H_1: Test results from students attending schools utilizing the extended plus calendar were not independent of test results of students attending schools with traditional calendars.

$x^2(4, \underline{N}=917) = 12.43, \underline{p}= 0.0144$

This p-value was less than .05, so the null hypothesis (H_0) was not accepted. Therefore, the alternative was true: there was a significant difference between the scores for each type of school calendar. In this case, the scores in the communication arts test were significantly higher for the District EP schools that operated on a traditional calendar. Table 26 and corresponding Figure 11 illustrate the percentage of students scoring in each quintile on the MAP test for both sets of schools. The schools operating on a traditional calendar had a higher percentage of students scoring in the Step One, Nearing Proficient, Proficient, and Advanced quintiles and fewer students in the Progressing quintile.

Table 26

Percent of Students Scoring in Each Quintile on the 2001 Communication Arts MAP Test

	Step1	Progressing	Nearing Proficient	Proficient	Advanced	students tested
Extended plus program	7.3	32.1	38.1	22.5	0	173
Traditional schools	8.6	21.9	41.2	27.8	0.5	744

Note. From Missouri Department of Elementary and Secondary Education, 2008b.

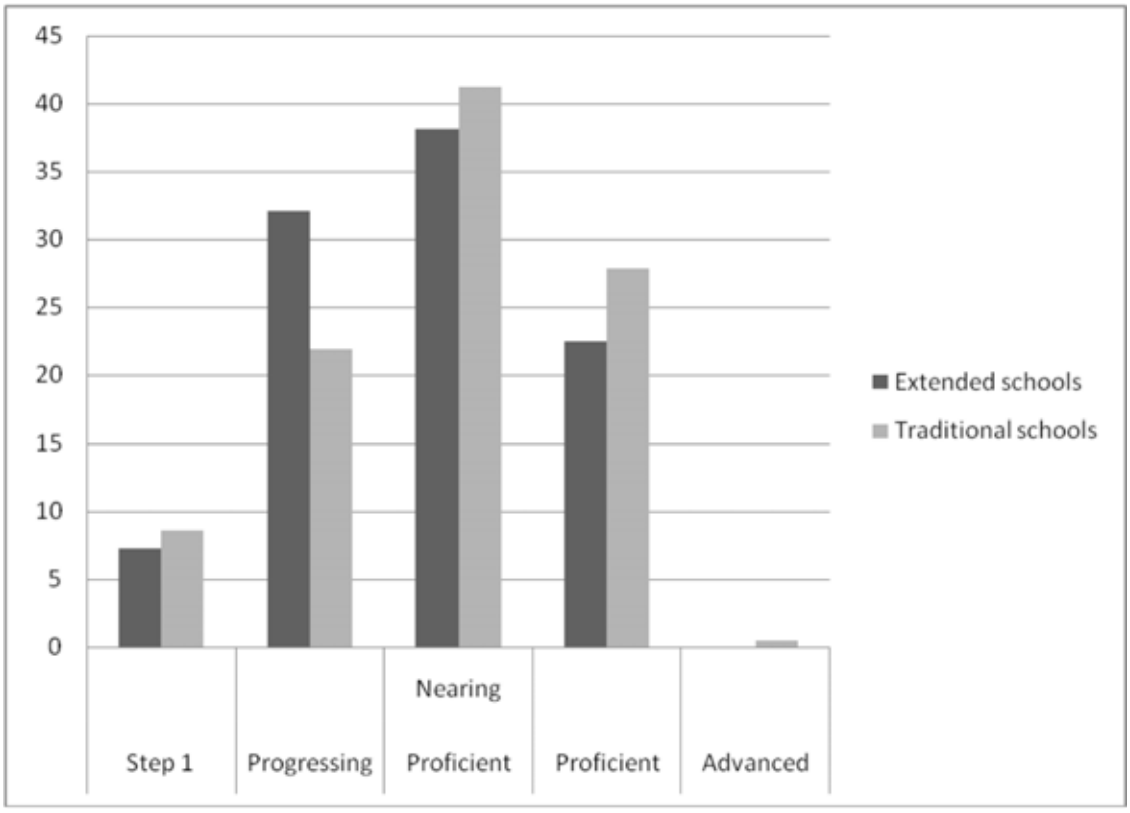

Figure 11. 2001 District EP Communication Arts MAP Scores

Note. From Missouri Department of Elementary and Secondary Education, 2008b.

In the area of mathematics,

H_0: Test results from students attending schools utilizing the extended plus calendar were independent of test results of students attending schools with traditional calendars.

H_1: Test results from students attending schools utilizing the extended plus calendar were not independent of test results of students attending schools with traditional calendars.

x^2 (4, N=1008) = 17.834, p=. 0.0013

This p-value was less than .05, so the null hypothesis (H_0) was not accepted. Therefore, the alternative was true: there was a significant difference between the scores for each type of school calendar. In this case, the scores on the mathematics test were significantly higher for District EP schools that operated on a traditional calendar. Table 27 and Figure 12 illustrate the percentage of students scoring in each quintile on the MAP test for both sets of schools. The schools operating on a traditional calendar had a higher percentage of students scoring in the Step One, Proficient and Advanced quintiles, and fewer students in the Progressing, and Nearing Proficient quintiles.

Table 27

Percent of Students Scoring in Each Quintile on the 2001 Mathematics MAP Test

	Step 1	Progressing	Nearing Proficient	Proficient	Advanced	Students Tested
Extended plus program	3	27.7	51.6	15.6	2.1	217
Traditional schools	3.7	22.8	42.5	24.4	6.6	791

Note. From Missouri Department of Elementary and Secondary Education, 2008b.

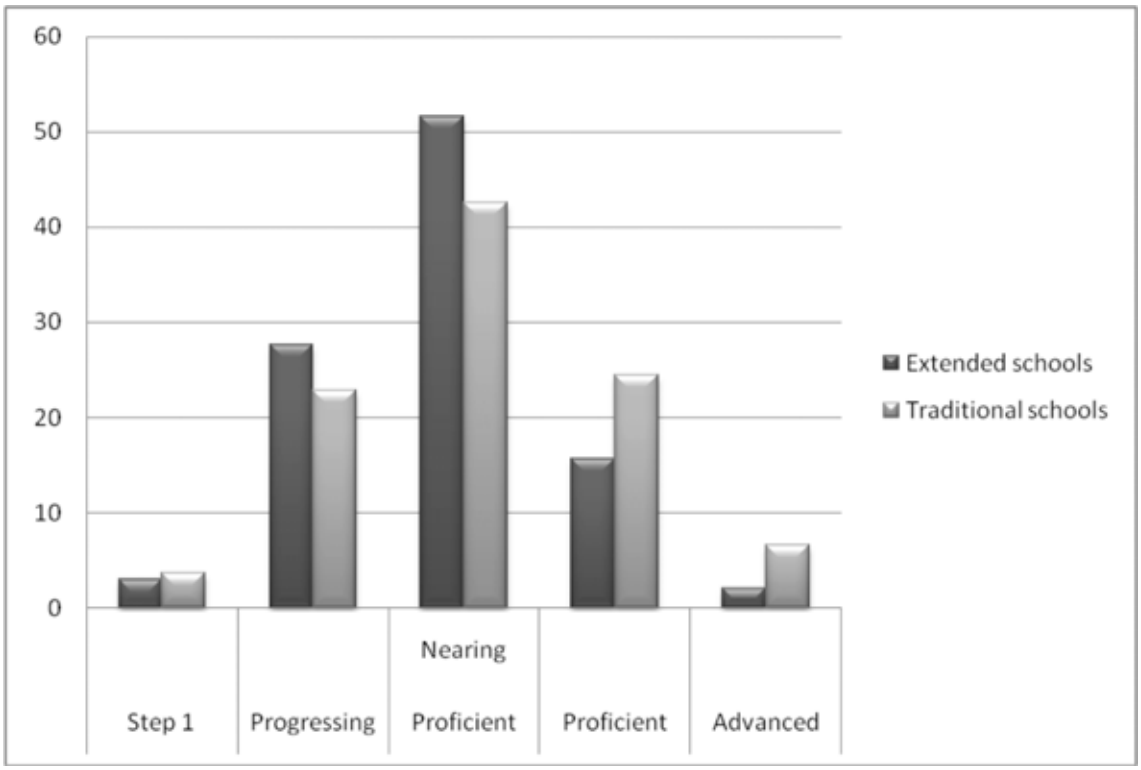

Figure 12. 2001 District EP Mathematics MAP Scores

Note. From Missouri Department of Elementary and Secondary Education, 2008b.

2002 results. In the area of communication arts,

H_0: Test results from students attending schools utilizing the extended plus calendar were independent of test results of students attending schools with traditional calendars.

H_1: Test results from students attending schools utilizing the extended plus calendar were not independent of test results of students attending schools with traditional calendars.

$x^2(4, \underline{N}=911) = 16.038, \underline{p}= 0.0030$

This p-value was less than .05, so the null hypothesis (H_0) was not accepted. Therefore, the alternative was true: there was a significant difference between the scores for each type of school calendar. In this case, the scores in the communication arts test were significantly higher for the District EP schools that operated on a traditional calendar. Table 28 and Figure 13 illustrate the percentage of students scoring in each quintile on the MAP test for both sets of schools. The schools operating on a traditional calendar had a higher percentage of students scoring in the Nearing Proficient, Proficient and Advanced quintiles and fewer students in the Step One and Progressing quintiles, although the percent of students scoring in the Nearing Proficient and Advanced quintiles were very similar.

Table 28

Percent of Students Scoring in Each Quintile on the 2002 Communication Arts MAP Test

	Step 1	Progressing	Nearing Proficient	Proficient	Advanced	students tested
Extended plus program	10	28.3	40	20	1.7	180
Traditional schools	5.9	19.7	40.2	32.3	1.9	731

Note. From Missouri Department of Elementary and Secondary Education, 2008b.

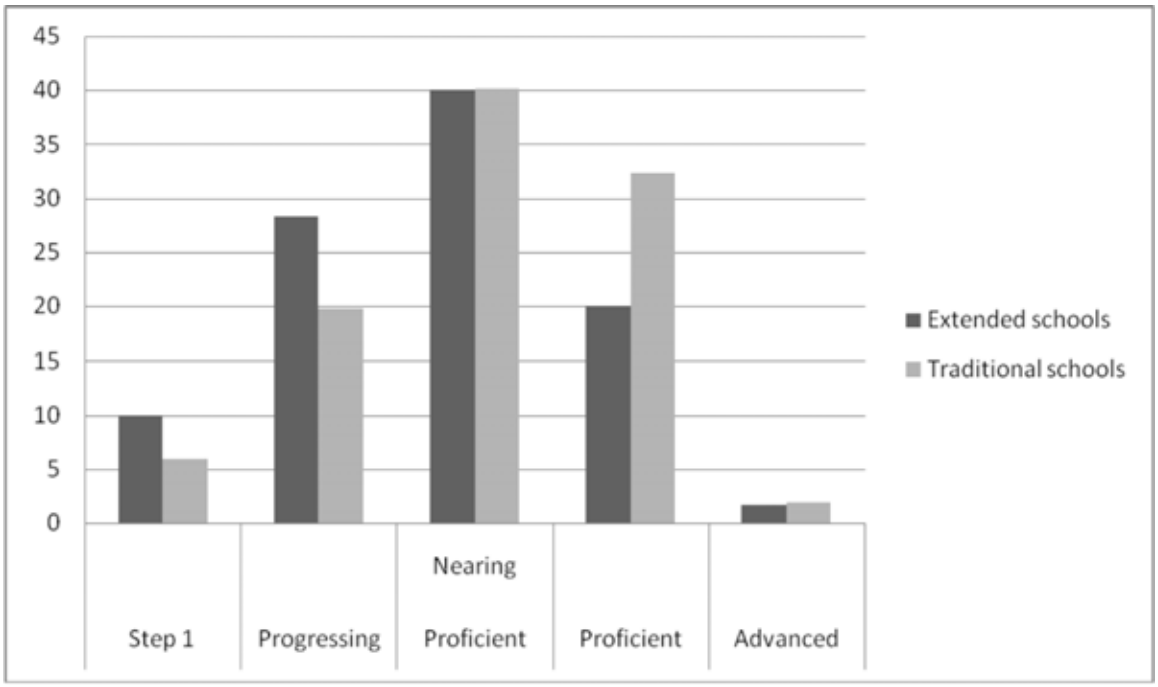

Figure 13. 2002 Ferguson-Florissant Communication Arts MAP Scores

Note. From Missouri Department of Elementary and Secondary Education, 2008b.

In the area of mathematics,

H_0: Test results from students attending schools utilizing the extended plus calendar were independent of test results of students attending schools with traditional calendars.

H_1: Test results from students attending schools utilizing the extended plus calendar were not independent of test results of students attending schools with traditional calendars.

$x^2(4, \underline{N}=912) = 13.838, \underline{p}= 0.0078$

This p-value was less than .05, so the null hypothesis (H_0) was not accepted. Therefore, the alternative was true: there was a significant difference between the scores for each type of school calendar. In this case, the scores on the mathematics test were

significantly higher for the District EP schools that operated on a traditional calendar. Table 29 and Figure 14 show the percentage of students scoring in each quintile on the MAP test for all schools involved. The schools operating on a traditional calendar had a higher percentage of students scoring in the Proficient and Advanced quintiles and fewer students in the Step One, Progressing, and Nearing Proficient quintiles than those schools on an extended school year calendar.

Table 29

Percent of Students Scoring in Each Quintile on the 2002 Mathematics MAP Test

	Step 1	Progressing	Nearing Proficient	Proficient	Advanced	students tested
Extended plus program	5	22.4	50.9	20.1	1.6	181
Traditional schools	2.5	21.5	43.6	28.3	4.1	731

Note. From Missouri Department of Elementary and Secondary Education, 2008b.

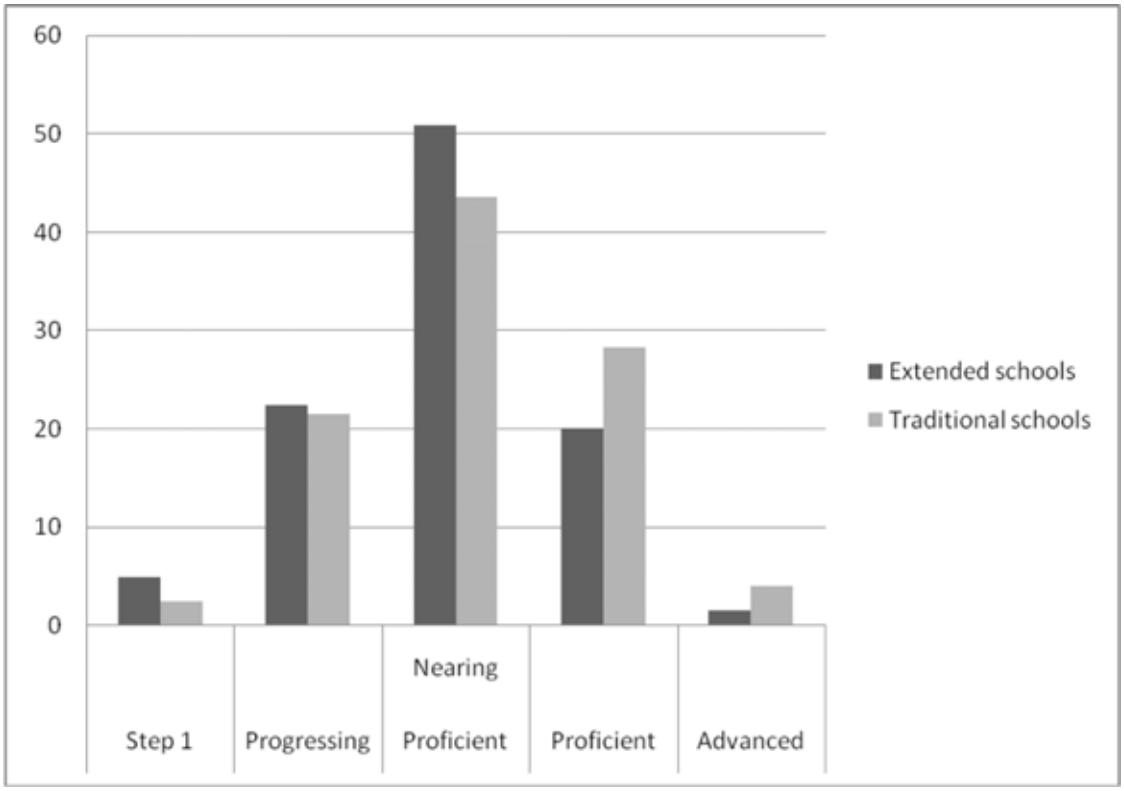

Figure 14. 2002 District EP Mathematics MAP Scores

Note. From Missouri Department of Elementary and Secondary Education, 2008b.

2003 results. In the area of communication arts,

H_0: Test results from students attending schools utilizing the extended plus calendar were independent of test results of students attending schools with traditional calendars.

H_1: Test results from students attending schools utilizing the extended plus calendar were not independent of test results of students attending schools with traditional calendars.

$x^2(4, \underline{N}=899) = 16.221, \underline{p}= 0.0027$

This p-value was less than .05, so the null hypothesis (H_0) was not accepted. Therefore, the alternative is true: there was a significant difference between the scores for each school calendar. In this case, the scores in the communication arts test were significantly higher for the District EP schools that operated on a traditional calendar. Table 30 and Figure 15 illustrate the percentage of students scoring in each quintile on the MAP test for both sets of schools. The schools operating on a traditional calendar had a higher percentage of students scoring in the Nearing Proficient, Proficient, and Advanced quintiles, and fewer students in the Step One and Progressing quintiles.

Table 30

Percent of Students Scoring in Each Quintile on the 2003 Communication Arts MAP Test

	Step 1	Progressing	Nearing Proficient	Proficient	Advanced	students tested
Extended plus program	15.3	34.9	29.8	20	0	183
Traditional schools	9.1	25	38.8	26.1	1	716

Note. From Missouri Department of Elementary and Secondary Education, 2008b.

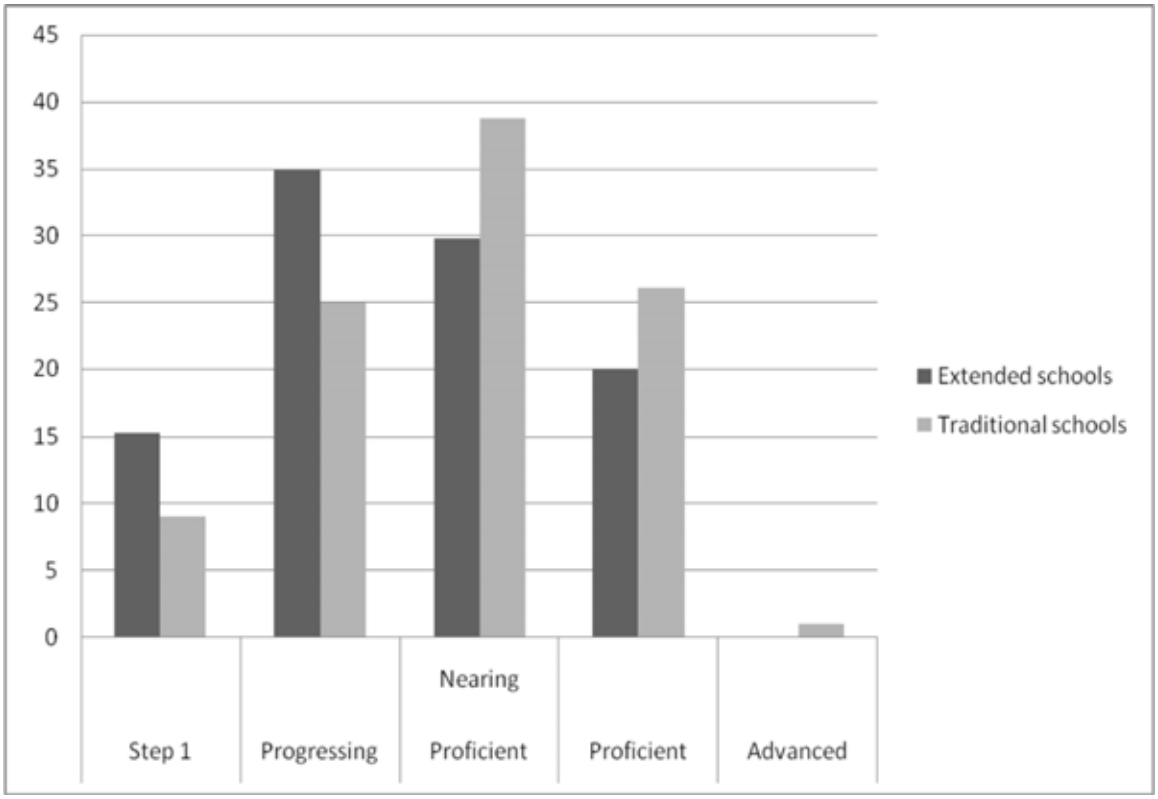

Figure 15. 2003 District EP Communication Arts MAP Scores

Note. From Missouri Department of Elementary and Secondary Education, 2008b.

In the area of mathematics,

H_0: Test results from students attending schools utilizing the extended plus calendar were independent of test results of students attending schools with traditional calendars.

H_1: Test results from students attending schools utilizing the extended plus calendar were not independent of test results of students attending schools with traditional calendars.

$x^2(4, \underline{N}=938) = 13.213, \underline{p}= 0.010$

This p-value was less than .05, so the null hypothesis (H_0) was not accepted. Therefore, the alternative was true: there was a significant difference between the scores for each type of school calendar. In this case, the scores on the mathematics test were significantly higher for the District EP schools that operated on a traditional calendar. Table 31 and a Figure 16 illustrate the percentage of students scoring in each quintile on the MAP test for both sets of schools. The schools operating on a traditional calendar had a higher percentage of students scoring in the Proficient and Advanced quintiles, and fewer students in the Step One, Progressing, and Nearing Proficient quintiles.

Table 31

Percent of Students Scoring in Each Quintile on the 2003 Mathematics MAP Test

	Step 1	Progressing	Nearing Proficient	Proficient	Advanced	students tested
Extended plus program	5.4	24.6	51.3	18.7	0	167
Traditional schools	3.9	19.5	45	26.3	5.3	771

Note. From Missouri Department of Elementary and Secondary Education, 2008b.

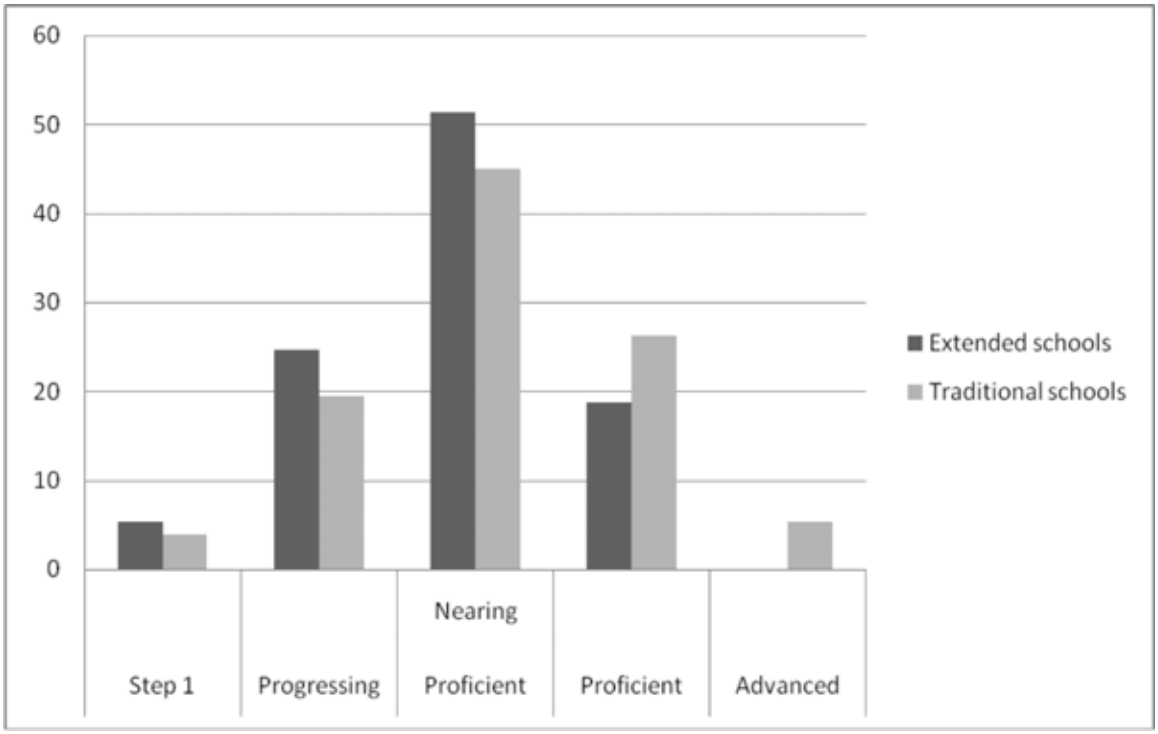

Figure 16. 2003 District EP Mathematics MAP Scores

Note. From Missouri Department of Elementary and Secondary Education, 2008b.

2004 results. In the area of communication arts,

H_0: Test results from students attending schools utilizing the extended plus calendar were independent of test results of students attending schools with traditional calendars.

H_1: Test results from students attending schools utilizing the extended plus calendar were not independent of test results of students attending schools with traditional calendars.

$x^2(4, \underline{N}=862) = 10.31, \underline{p}= 0.0355$

This p-value was less than .05, so the null hypothesis (H_0) was not accepted. Therefore, the alternative was true: there was a significant difference between the scores

for each type of school calendar. In this case, the scores on the communication arts test were significantly higher for the District EP schools that operated on a traditional calendar. Table 32 and Figure 17 illustrate the percentage of students scoring in each quintile on the MAP test for both sets of schools. The schools operating on a traditional calendar had a higher percentage of students scoring in the Nearing Proficient, Proficient, and Advanced quintiles, and fewer students in the Step One and Progressing quintiles, although the percentage in Step One and Nearing Proficient were very similar.

Table 32

Percent of Students Scoring in Each Quintile on the 2004 Communication Arts MAP Test

	Step 1	Progressing	Nearing Proficient	Proficient	Advanced	Students Tested
Extended plus program	7.35	30.45	40.3	21.9	0	194
Traditional schools	7	21.3	40.7	30.1	0.9	668

Note. From Missouri Department of Elementary and Secondary Education, 2008b.

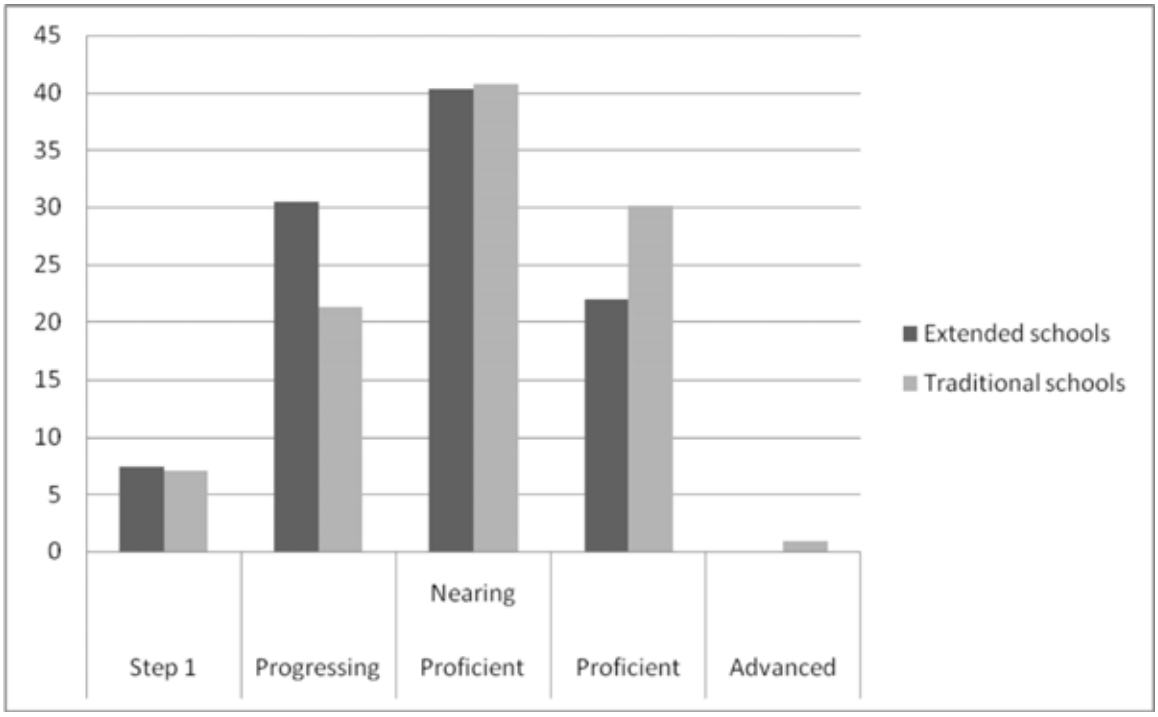

Figure 17. 2004 District EP Communication Arts MAP Scores

Note. From Missouri Department of Elementary and Secondary Education, 2008b.

In the area of mathematics,

H_0: Test results from students attending schools utilizing the extended plus calendar were independent of test results of students attending schools with traditional calendars.

H_1: Test results from students attending schools utilizing the extended plus calendar were not of test results of students attending schools with traditional calendars.

$x^2 (4, \underline{N}=909) = 11.003, \underline{p}= 0.0265$

This p-value was less than .05, so the null hypothesis (H_0) was not accepted. Therefore, the alternative was true: there was a significant difference between the scores

for each type of school calendar. In this case, the scores on the mathematics test were significantly higher for the District EP schools that operated on a traditional calendar. Table 33 and Figure 18 illustrate the percentage of students scoring in each quintile on the MAP test for both sets of schools. The schools operating on a traditional calendar had more students in the Proficient and Advanced quintiles, and the schools operating an extended plus program had a higher percentage of students scoring in the Step One, Progressing, and Nearing Proficient quintiles.

Table 33

Percent of Students Scoring in Each Quintile on the 2004 Mathematics MAP Test

	Step 1	Progressing	Nearing Proficient	Proficient	Advanced	students tested
Extended plus program	3.5	23.8	47.1	23.5	2.1	169
Traditional schools	2.7	18	42.7	28.9	7.7	740

Note. From Missouri Department of Elementary and Secondary Education, 2008b.

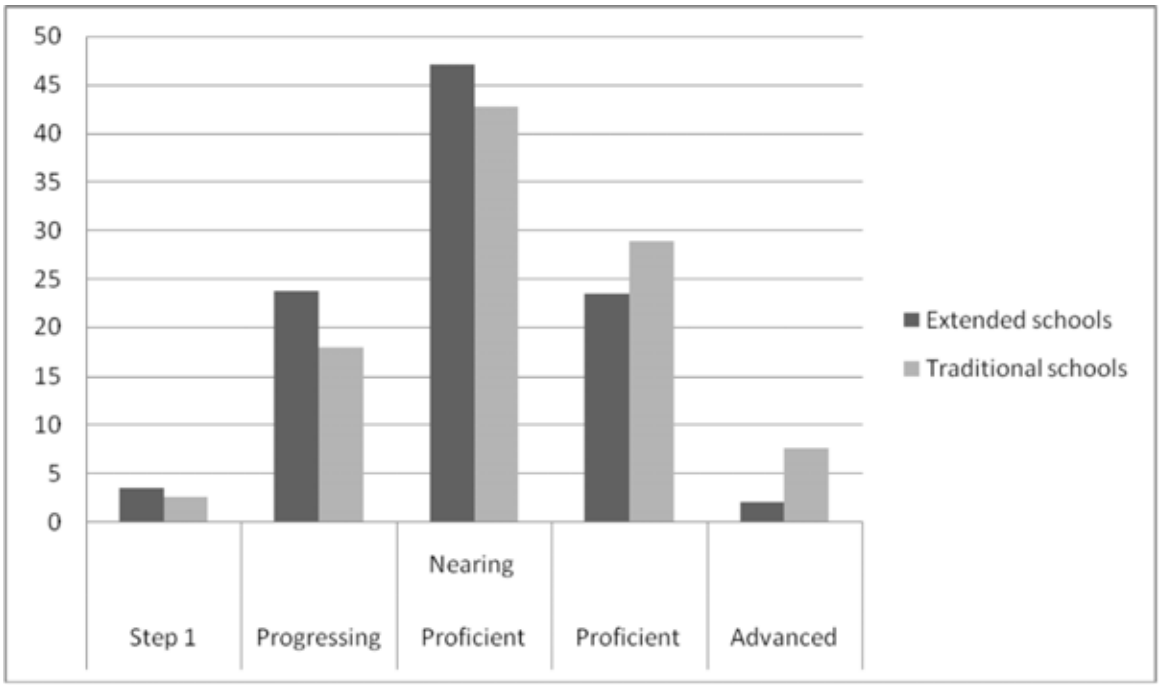

Figure 18. 2004 District EP Mathematics MAP Scores

Note. From Missouri Department of Elementary and Secondary Education, 2008b.

2005 results. In the area of communication arts,

H_0: Test results from students attending schools utilizing the extended plus calendar were independent of test results of students attending schools with traditional calendars.

H_1: Test results from students attending schools utilizing the extended plus calendar were not independent of test results of students attending schools with traditional calendars.

$x^2(4, \underline{N}=838) = 2.611, \underline{p}= 0.6249$

This p-value is greater than .05, so the null hypothesis (H_0) was accepted. Therefore, there was not a significant difference between the scores for each type of school calendar. Table 34 and Figure 19 illustrate the percentage of students scoring in

each quintile on the MAP test for schools operating a traditional school calendar and those operating an extended plus program. The schools operating an extended plus program had a higher percentage of students scoring in the Nearing Proficient, Proficient, and Advanced quintiles, and fewer students in the Step One and Progressing quintiles, although the percentages in all of the quintiles were very close. This was a reversal from the results seen in 2001 when this study began.

Table 34

Percent of Students Scoring in Each Quintile on the 2005 Communication Arts MAP Test

	Step 1	Progressing	Nearing Proficient	Proficient	Advanced	students Tested
Extended plus program	8.7	20	38.8	30.3	2.2	166
Traditional schools	9.8	23.5	38.1	26.5	2.1	672

Note. From Missouri Department of Elementary and Secondary Education, 2008b.

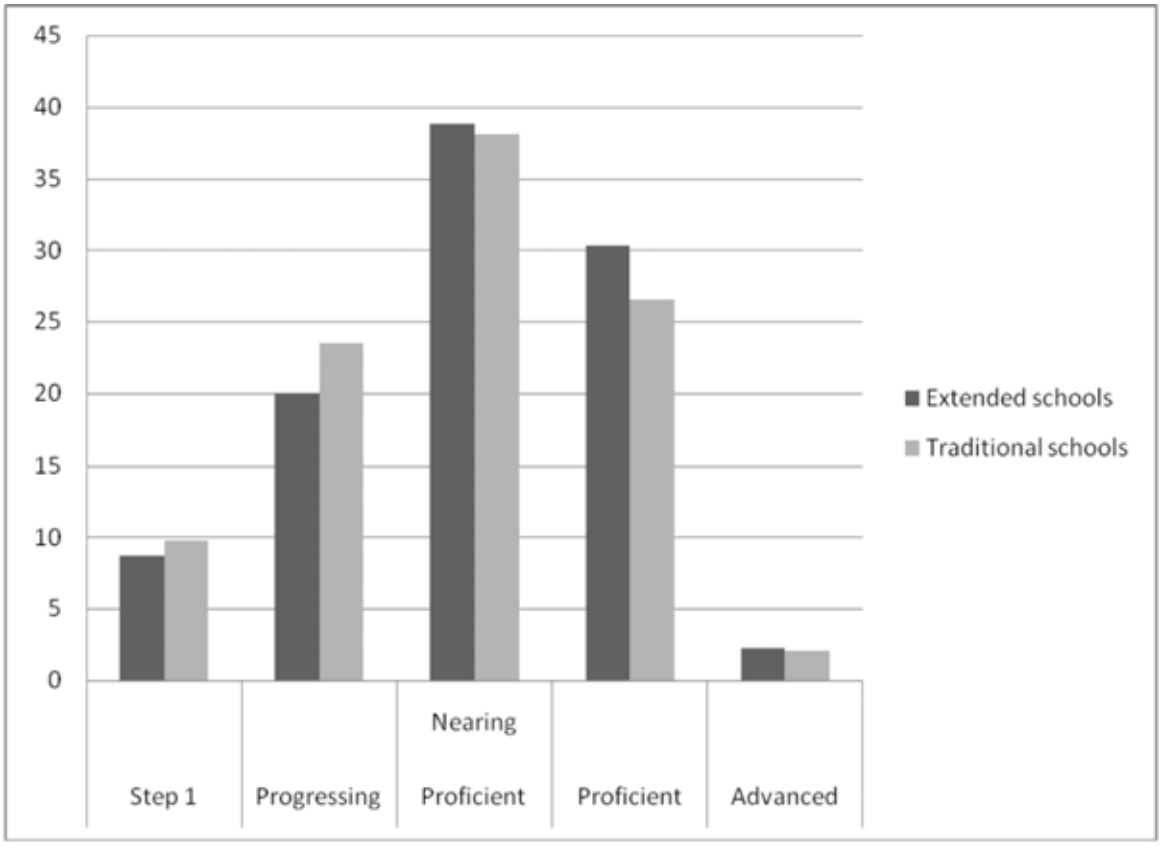

Figure 19. 2005 District EP Communication Arts MAP Scores

Note. From Missouri Department of Elementary and Secondary Education, 2008b.

In the area of mathematics,

H_0: Test results from students attending schools utilizing the extended plus calendar were independent of test results of students attending schools with traditional calendars.

H_1: Test results from students attending schools utilizing the extended plus calendar were not independent of test results of students attending schools with traditional calendars.

x^2 (4, $\underline{N}$=881) = 11.652, $\underline{p}$= 0.0201

This p-value was less than .05, so the null hypothesis (H_0) was not accepted. Therefore, the alternative was true: there was a significant difference between the scores for each type of school calendar. In this case, the scores on the mathematics test were significantly higher for the District EP schools that operated on a traditional calendar. Table 35 and Figure 20 show the percentage of students scoring in each quintile on the MAP test for both sets of schools. The schools operating on a traditional calendar had a higher percentage of students scoring in the Step One, Proficient and Advanced quintiles and fewer students in the Progressing, and Nearing Proficient quintiles.

Table 35

Percent of Students Scoring in Each Quintile on the 2005 Mathematics MAP Test

	Step 1	Progressing	Nearing Proficient	Proficient	Advanced	Students Tested
Extended plus programs	0.9	24.6	45.7	26.2	2.6	190
Traditional schools	1.7	17.2	43.8	28.8	8.5	691

Note. From Missouri Department of Elementary and Secondary Education, 2008b.

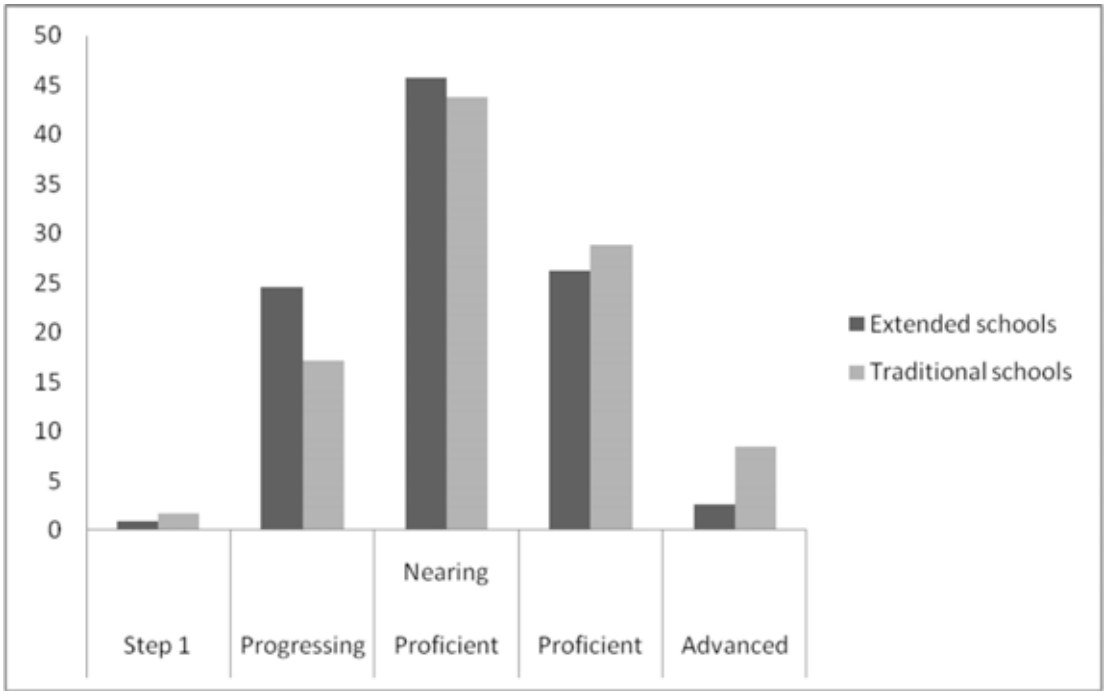

Figure 20. 2005 District EP Mathematics MAP Scores

Note. From Missouri Department of Elementary and Secondary Education, 2008b.

2001 to 2005 change in scores. Another method of comparison to consider the impact of an extended plus program was to utilize a Chi-Square Test of Independence to compare the number of students in each quintile on the MAP test scores in 2001 to those for the students attending on an extended-year schedule in 2005 and those on a traditional calendar. In the area of communication arts, 39.4 percent of third grade students scored in the lower two quintiles, and by 2005, only 28.7 percent were in the same lower quintiles. In 2001, 22.5 percent scored in the top two quintiles, with none scoring advanced, while in 2005, 32.5 percent scored in those top two quintiles with 2.2 percent scoring advanced. This is illustrated in Table 36 and Figure 21.

H_0: Test results from students attending schools utilizing the extended plus calendar in 2005 were independent of test results of students attending schools with extended plus calendars in 2001.

H_1: Test results from students attending schools utilizing the extended plus calendar in 2005 were not independent of test results of students attending schools with extended plus calendars in 2001.

x^2 (4, N=339) = 15.081, p= 0.0045

This p-value was less than .05, so the null hypothesis (H_0) was not accepted. Therefore, the alternative was true: there was a significant difference between the scores for third grade communication arts in 2001 and the scores for third grade communication arts in 2005. This would indicate that the third grade communication arts scores for students in the extended plus program were significantly higher in 2005 than in 2001 (see Table 36).

Table 36

Percent of Third Grade Students Scoring in Each Quintile on the Communication Arts MAP Test 2001 and 2005

	Step 1	Progressing	Nearing Proficient	Proficient	Advanced
2001	7.3	32.1	38.1	22.5	0
2005	8.7	20	38.8	30.3	2.2

Note. From Missouri Department of Elementary and Secondary Education, 2008b.

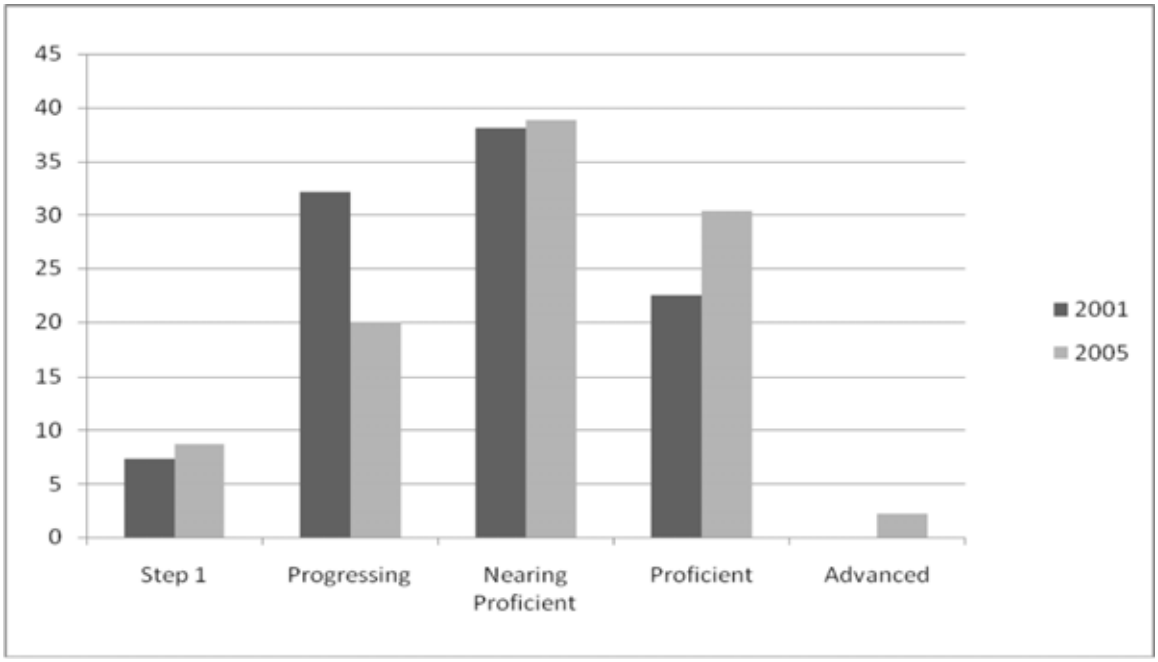

Figure 21. 2001 and 2005 District EP Third Grade Communication Arts MAP Scores

Note. From Missouri Department of Elementary and Secondary Education, 2008b.

In 2001, in the area of mathematics, 30.7 percent of fourth grade students scored in the lower two quintiles, and by 2005, only 25.5 percent were in the same lower quintiles. In 2001, 17.7 percent scored in the top two quintiles, while in 2005, 28.8 percent scored in those top two quintiles. This is illustrated in Table 37 and Figure 22 below.

H_0: Test results from students attending schools utilizing the extended plus calendar in 2005 were independent of test results of students attending schools with extended plus calendars in 2001.

H_1: Test results from students attending schools utilizing the extended plus calendar in 2005 were not independent of test results of students attending schools with extended plus calendars in 2001.

x^2 (4, $\underline{N}$=407) = 9.164, $\underline{p}$= 0.0571

This p-value was greater than .05, so the null hypothesis (H_0) was accepted. Therefore, there was not a significant difference between the scores for fourth grade mathematics in 2001 and the scores for fourth grade mathematics in 2005.

Table 37

Percent of Fourth Grade Students Scoring in Each Quintile on the Mathematics MAP Test 2001 and 2005

	Step 1	Progressing	Nearing Proficient	Proficient	Advanced
2001	3	27.7	51.6	15.6	2.1
2005	0.9	24.6	45.7	26.2	2.6

Note. From Missouri Department of Elementary and Secondary Education, 2008b.

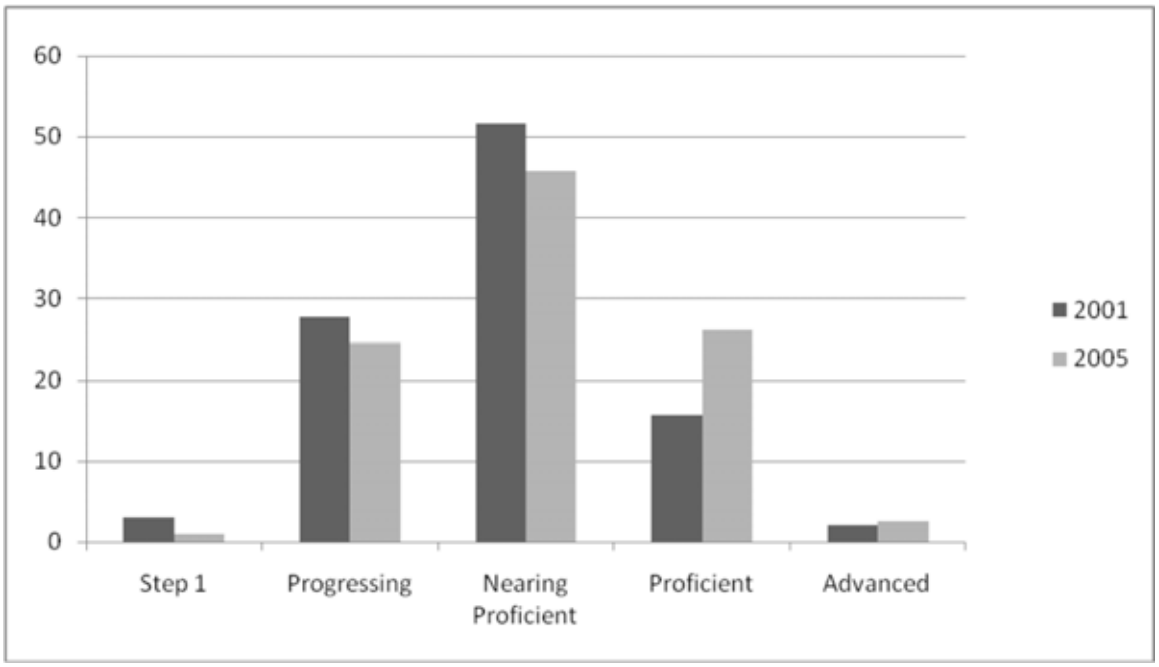

Figure 22. 2001 and 2005 District EP Fourth Grade Mathematics MAP Scores

Note. From Missouri Department of Elementary and Secondary Education, 2008b.

Additional comparison. Another method of evaluating the MAP test scores is the MAP Performance Index. The MAP Performance Index allows comparison of student improvement on the MAP and can be used to show changes in performance over time. "The index approach is based on a composite of the performance of all students across all MAP achievement levels" (Missouri Department of Elementary and Secondary Education, 2008b). The Missouri Department of Elementary and Secondary Education gives the following instructions for calculating the index score from the percent of students in each quintile.

> Multiply the percent Advanced by three, percent Proficient by two and a half, percent Nearing Proficient by two, percent Progressing by one and a half, and percent Step One by one. These products are then summed to produce the MPI [MAP Performance Index] which ranges from 100-300 (2007).

MAP Index Scores from the schools on the extended plus program in District EP were compared to those in the district on a traditional calendar to show the difference in improvement between the two groups. Tables 38 and 39 as well as Figures 20 and 21 chart the progress of the students in this district and show the improvement made in the areas of communication arts and mathematics from 1998 (when the extended school year program began) through 2005. In the area of communication arts, the difference between the two groups went from twenty-two points in favor of the traditional schools in 1998 to five points in favor of the extended plus program in 2005. During the same time, in the area of mathematics, the difference between the two groups went from twenty-nine points in favor of traditional schools in 1998 to nine points in 2005.

Table 38

District EP *Communication Arts MAP Index Scores 1998-2005*

	1998	1999	2000	2001	2002	2003	2004	2005
Extended School Year	160	175	186	184	187	178	188	199
Traditional School Year	188	189	196	195	202	192	198	194

Note. From Ferguson-Florissant School District. (1998). *Single-Track Extended School Year Proposal.* St. Louis, MO: Bower.

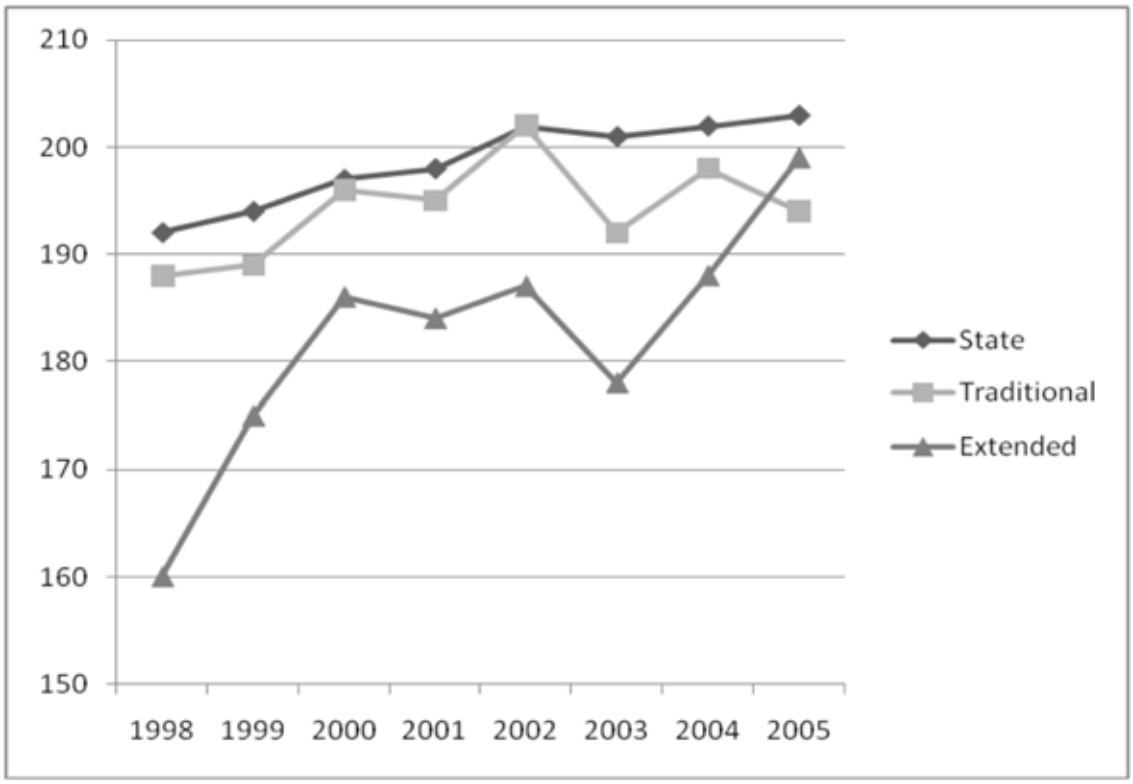

Figure 23. District EP Communication Arts MAP Index Scores 1998-2005

Note. From Ferguson-Florissant School District. (1998). *Single-Track Extended School Year Proposal.* St. Louis, MO: Bower.

Table 39

District EP *Mathematics MAP Index Scores 1998-2005*

	1998	1999	2000	2001	2002	2003	2004	2005
Extended plus program	174	178	180	192	194	193	199	203
Traditional school year	203	204	200	204	205	205	210	212

Note. From Ferguson-Florissant School District. (1998). *Single-Track Extended School Year Proposal.* St. Louis, MO: Bower.

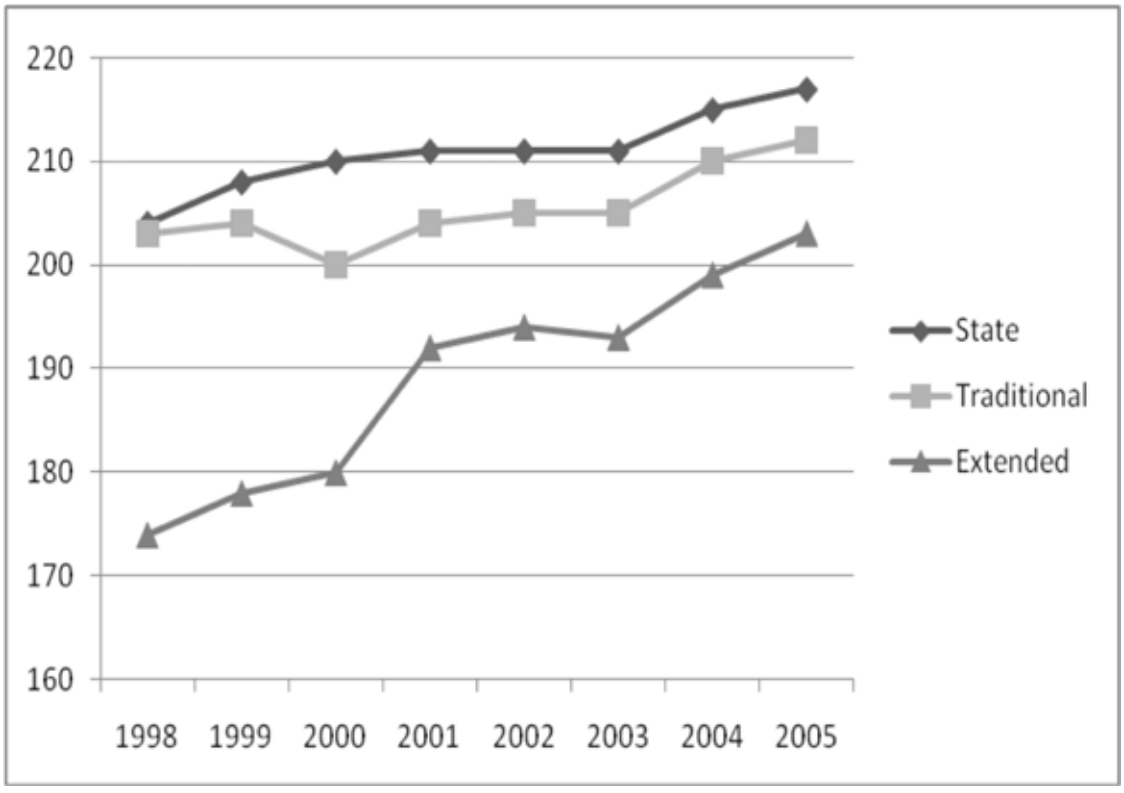

Figure 24. District EP Mathematics MAP Index Scores 1998-2005

Note. From Ferguson-Florissant School District. (1998). *Single-Track Extended School Year Proposal.* St. Louis, MO: Bower.

Summary

Year-round schedule. The results of this study contradicted the researcher's original hypothesis that a year-round calendar would have a significant impact on student achievement. Over the five years studied, there were four instances in which a significant difference occurred between the scores of the District YR (on a year-round calendar) and District TR (on a traditional calendar). In 2002 and 2004, District TR had significantly higher scores in the area of communication arts on the MAP test. District YR had significantly higher scores on the MAP in the area of communication arts in 2001 and in mathematics in 2002. Because these differences were not consistent, it is reasonable to conclude that a year-round calendar has not had an impact on student achievement in this district.

Extended plus. The results of this study supported the researcher's original hypothesis that an extended plus program would have a significant impact on student achievement during the last year of the study in the area of communication arts. However, the researcher's original hypothesis was contradicted in the area of mathematics for all five years and in the area of communication arts four of the five years. Scores from the MAP testing in 2001 through 2005 from District EP were collected and compared in the areas of mathematics and communication arts. The results of the chi-square Test of Independence analysis showed a significant difference in scores from the two groups for all five years in the area of communication arts, but not in the area of mathematics.

CHAPTER FIVE - DISCUSSION

The results of this study, as determined by comparing five years of MAP test scores in schools with traditional and year-round calendars, failed to show that the implementation of a year-round calendar alone had an impact on student achievement. However, recall from Chapter Two that adding academic services during the breaks resulted in increases in achievement for those students. Some communities prefer the year-round calendar and some need it in the multi-track form to meet the volume requirements of their community, but the research shows that the calendar itself does not lead to increased student scores.

Similarly, the results of the comparison of test scores in schools on a traditional school year with those on an extended plus (an extended school year that included teacher selection, additional professional development for teachers and research based instruction), failed to show an impact on student achievement in the area of mathematics. However, in the area of communication arts, the analysis of the MAP test results over the five years studied showed statistically significant improvement in the scores for students on the extended plus calendar. This analysis showed that there was a significant difference in the scores of the two groups in the first four years of the study, but that there was no significant difference between test scores of the two groups in the final year. The fact that the significant difference in the scores of the two groups during the first four years improved to a non-significant difference in the fifth year, while the higher scores of the schools on the traditional calendar were maintained, indicates that the use of extended plus contributed to an improvement in achievement.

The comparison of MAP index scores indicated that students attending schools with an extended plus calendar were improving at a faster rate than those attending on a traditional calendar. Students attending District EP on a traditional calendar averaged an index score of 188 in 1998 and increased to a score of 194 in 2005, with an average as high as 198 during that time. The students attending schools in the same district, but with extended plus, averaged an index score of 160 in 1998 and increased to a score of 189 in 2005. Over the seven-year period, the students attending on the traditional calendar showed an increase of six MAP index points, while the students attending on the extended plus program showed an increase of twenty-nine points over the same time period. This supports the findings of the analysis discussed above.

After the first three or four years, the schools on the extended school year calendar remained below those of students attending a traditional calendar and began to follow the same trend in scores. The gap closed a great deal in those first few years, but in the last years, the students continued to progress at the same rate as their peers on the other calendar.

Implication for Effective Schools

Using information gained from this and previous studies, schools can confidently make the decision on which type of calendar is best for their community. Students on a year-round calendar, with no extra days added, have scored similar to those on a traditional calendar. Reviewing other studies, however, it has been found that students attending school on a year-round calendar with remedial opportunities during the intercessions showed increased scores (McMillen, n.d.). A district considering instituting

a year-round calendar for academic reasons would, therefore, need to strongly consider including remediation during the breaks.

Test scores for students attending school in extended plus in District EP did show improvement over time, but other changes, made at the same time as the calendar change, may have also contributed to this improvement. These changes included implementation of new mathematics and reading programs, as well as extensive professional development for the teachers in the extended plus (J.A. Clay, personal communication, June 13, 2008). A great deal of focus was put on selecting teachers who were enthusiastic about the new program and then training those teachers in the new procedures involved. These improvements could account for the fact that students who attended school on the extended plus showed a large increase the first three years after the implementation of that calendar. Through a review of literature, it was shown that the number of days of classes was not a predominant reason for student achievement but that the teachers and programs involved made the difference (Johnson & Spradlin, 2007).

It is important for school districts to choose a calendar based on the needs of their students. Since this study showed no significant academic benefit for students on the year-round calendar, districts should look at the calendar that fits the lifestyle of the families in their communities and the needs of the students and the districts. If overcrowding is a concern, the multi-cycle year-round calendar is effective in increasing the capacity of a building. For communities that enjoy a break during the school year and more flexibility in vacationing, the year-round calendar can be a good solution. However, for those considering use of a year-round calendar to further academic achievement, implementation of remediation during the breaks is essential. When considering

extending the school calendar, a district should examine and change, if necessary, the current curriculum, staff, and programs and consider the use of proven, research-based methods in order to increase academic achievement. The school calendar alone has not been shown to determine the students' level of achievement.

Recommendations for Practice

Based on the results of this study, districts using or considering a year-round calendar to increase student achievement should look at their options. Unless a year-round calendar has additional days included for remediation, as suggested in Chapter Two, student achievement is not significantly impacted. Some districts on a year-round calendar have found that their communities enjoy the breaks throughout the year and feel the added expense that may come with this type of calendar is justified. Other communities feel that other expenses that directly impact student achievement should be a priority. Any school considering a year-round calendar should look at all sides of this debate to see if the decision is right for their students.

Similarly, the implementation of an extended school year calendar has not shown to improve student achievement on its own, but it can be effective when combined with research based teaching strategies and an aligned curriculum. Teachers must have some say in the calendar under which they will work to ensure the best success. The community's support is also an important component in the success of this calendar, and parents must be open to the idea of students attending school additional days each year. With all of these components in place, the extended school year calendar can be an effective way to improve student achievement.

Recommendations for Future Research

Based on the finding of this study, the extended plus program improved student achievement. This program had three important distinguishing components (teacher selection, professional development, and research-based programs) that warrant further investigation. A study to determine which of these components have the most impact on student achievement would narrow the focus to one area instead of three. With the economic difficulties currently facing school districts, school officials must find the most efficient ways to stretch tax dollars. A cost benefit analysis could assist a district in determining which program would give the best results for the money spent. By isolating the three components, a future researcher could rank by effectiveness. A study in this area could assist many districts in implementing the best strategies for raising student achievement for the least cost.

Summary

Year-round schooling has been used in the United States as far back as 1904. According to this study, as well as other referenced studies, a single-track year-round calendar does not have a significant impact on student achievement unless remedial opportunities exist. It seems that the best use for a year-round calendar would be to have a multi-track system, which is effective for cost efficiency, not academic improvement. Should the community feel that the year-round calendar is appropriate for their needs, it is an effective means of educating students.

Extended school year is an alternative that districts have turned to in order to improve student achievement. Many components are necessary for this calendar to be effective. This study and others have shown improved student achievement when all

necessary components are included. School district personnel considering this alternative should plan ahead and ensure they are prepared appropriately.

Considering this study as well as the review of others, the determination was that student achievement is not decided by calendar alone. Many components combine to ensure student success. School officials looking to improve achievement may consider reviewing the district curriculum, employing effective teachers, and implementing research based methodology before looking to add days to the school year. District personnel should remember that it is not the number of days that students sit in a classroom, but what is done during that time to ensure student learning that will, in turn, impact student achievement.

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FRANCIS HOWELL SCHOOL DISTRICT
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Daniel E. O'Donnell, Ed.D.
Superintendent of Schools
636-939-8500
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October 13, 2005

To Whom It May Concern:

Mrs. Malinda Meier has my permission to conduct an educational research project required by Lindenwood University for the purpose of completing her Educational Specialist Degree.

The research project will be conducted between October 20, 2005 and December 31, 2005 and will comply with all the policies and procedures established by the Board of Education of the Francis Howell School District. This research project will involve accessing core data on elementary students' MAP scores. No student names or identification numbers will be published.

Sincerely,

Daniel E. O'Donnell, Ed.D.
Superintendent of Schools

DEO/ch

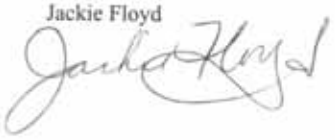
November 5, 2007

To Whom It May Concern:

Mrs. Malinda Meier has my permission to conduct an educational research project required by Lindenwood University for the purpose of completing her Educational Specialist Degree.

The research project will be conducted between October, 2007 and December 31, 2008 and will comply with all the policies and procedures established by the Board of Education of the Fort Zumwalt School District. This research project will involve accessing core data on elementary students' MAP scores. No student names or identification numbers will be published.

Jackie Floyd



Ferguson-Florissant School District

Jeffrey R. Spiegel, Superintendent of Schools
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October 13, 2008

To Whom It May Concern:

Mrs. Malinda Meier has my permission to conduct an educational research project required by Lindenwood University for the purpose of completing her Educational Doctorate Degree.

The research project will begin in October, 2008 and will comply with all the policies and procedures established by the Board of Education of the Ferguson-Florissant School District. This research project will involve accessing core data on elementary students' MAP scores. No student names or identification numbers will be published.

Sincerely,

Jeffrey R. Spiegel
Superintendent of Schools
Ferguson-Florissant School District

LINDENWOOD UNIVERSITY

Application for EXEMPT status
For IRB Review of Research Proposal

Please indicate which category of exemption (see pg. 6 of this form) justifies your request for Exempt status: I d – existing data . (Note that exemption from full committee review still requires completion of this form and review and approval by one member of the IRB)

1. Title of Project: Te Effects of Year-Round Calendars and Extended School Year Calendars compared with Traditional Calendars on Student Test Scores

2. Dissertation Chair:	Department:	Extension:	e-mail:
Dr. Cynthia Vitale	Education	949-4315	cvitale@lindenwood.edu
3. Primary Investigator(s):	Department:	Local phone:	e-mail:
Malinda Meier	Education	314-504-3155	mindym@charter.net

4. Anticipated starting and ending date for this project (data collection cannot begin until this IRB application has been approved): December 2008

5. Is this proposal under review by another IRB? YES / **NO**

6. State the purpose and rationale of the proposed project.
The purpose of this study is to investigate the impact of a year-round calendar and an extended year calendar on student achievement. Missouri Assessment Program (MAP) test scores will be compared between third and fourth grade students from the Francis Howell and Fort Zumwalt School Districts in St. Charles Missouri. The Francis Howell School District has operated on a year-round calendar since 1969 while the Fort Zumwalt School District implements a traditional calendar. The Ferguson-Florissant School District began an extended school year calendar for four elementary school buildings in 1998 to improve student achievement. MAP test scores will be compared between the four elementary schools on an extended year calendar and the other Ferguson-Florissant elementary schools. With the focus of No Child Left Behind, school districts are trying to find ways to increase student test scores. All data used will come from the Missouri Department of Elementary and Secondary Education website and is public information.

7. State the hypothesis(es) or research question(s) of the proposed project:
If students attend school on a year-round calendar, then their Missouri Assessment Program test scores will be significantly higher than students who attend school on a traditional school calendar.

If students attend school on an extended school year calendar with additional teacher training and specifically selected teachers, then their Missouri Assessment Program test scores will be significantly higher than students who attend school on a traditional school calendar.

8. Data source: place check on left next to best description of your data sources

X a) I am only using an anonymous publicly available data set from MO Department of Elementary and Secondary Education

_____ b) I am using an anonymous public data set and some interviews, surveys, focus groups and/or observations of adults using consent forms, and my data set comes from _____

_____ c) I am conducting interviews, surveys, focus groups and/or observations of people, but all are adults of legal age and will sign a consent form.

9. If you have participants involved in the study (other than database subjects):

a. Indicate how many persons total will be recruited as participants in this study _____.

b. Indicate source of participants and approximate number from each group:

_____ LU undergraduate and/or graduate classes – students of legal age
_____ LU Human Subject Pool (LU HSP) – students of legal age
_____ Other LU adults, specify sources _____
_____ School Districts _____
_____ Community Agencies (please list) _____
_____ Businesses (please list) _____

Other (specify):

No participants will be recruited. MAP data will be gathered from a public website and only public information will be used.

c. Describe the process of participant recruitment. Provide a copy of any materials to be used for recruitment (e.g. posters, flyers, advertisements, letters, telephone and other verbal scripts).

d. Where will the study take place?

_____ On campus – Explain:

__X__ Off campus – Explain: Data will be compared using my home computer.

10. Methodology/procedures:

a. Provide a sequential description of the procedures to be used in this study.

Data from third and fourth grade MAP scores will be collected from the Missouri Department of Elementary and Secondary Education (DESE) website for all three districts involved. The data will be compared using a Chi Square of independence to determine whether the difference is significant. Throughout this analysis, I will hope to determine whether or not the school calendar impacts student test scores.

b. Which of the following procedures will be used? Provide a copy of all materials to be used in this study.

_____ Observing participants in a research setting (i.e. classroom, playground, school board meetings, mall, park, etc)
_____ Survey(s) or questionnaire(s) (mail-back)-Are they standardized?
_____ Survey(s) or questionnaire(s) (in person)-Are they standardized?
_____ Computer-administered task(s) or survey(s)-Are they standardized?
_____ Interview(s) (in person) of adults
_____ Interview(s) (by telephone) of adults
_____ Focus group(s) with adults
_____ Audiotaping adults
_____ Videotaping adults
__X__ Analysis of secondary data (no involvement with human participants)- specify source

11. Will the results of this research be made accessible to participants? If so, explain and attach a copy of any feedback forms that will be used.
The results of this research will be made available to the districts involved. They will be provided a copy of the study once approved.

12. Potential Benefits and Compensation from the Study:

a. Identify and describe any known or anticipated benefits (perhaps academic, psychological, or social) to the participants from their involvement in the project.
Districts can evaluate their school schedules to see if another option would be better for their students.

b. Identify and describe any known or anticipated benefits to society from this study.
The community would know which calendar would be most effective in educating their students.

c. Describe any anticipated compensation (monetary, grades, extra credit, other) to participants.

None.

13. Potential Risks from the Study:

a. Identify and describe any known or anticipated risks (i.e. physical, psychological, social, economic, legal, etc) to participants involved in this study.

None, all data used is public information. No individuals will be identified.

b. Will deception be used in this study? If so, explain the rationale.

No.

c. Does this project involve gathering information about sensitive topics? Such topics include: political affiliations; psychological disorders of participants or their families; sexual behavior or attitudes; illegal, antisocial, self-incriminating or demeaning behavior; critical appraisals of participants' families or employers; legally recognized privileged relationships (lawyers, doctors, ministers); income; religious beliefs and practices. If so, **exempt review is not an option.**

No.

d. Could any of the participants be considered physically or emotionally vulnerable (children, institutionalized persons, pregnant women, persons with impaired judgment)? If so, **exempt review is not an option** and you must seek full IRB approval.

No, there are no specific participants mentioned. All data is public information.

e. If you are gathering information from sources other than anonymous publicly available databases - Explain the procedures to be used to ensure anonymity of participants and confidentiality of data both during the data gathering phase of the research, in the storage of data, and in the release of the findings. How will confidentiality be explained to participants?

Not Applicable. All data is from an anonymous publicly available database.

f. Indicate the duration and location of secure data storage and the method to be used for final disposition of the data.

Paper Records
_____ Confidential shredding after _____ years.
_____ Data will be retained indefinitely in a secure location.
Where? _____
__X__ Data will be retained until completion of specific course and then destroyed.

Audio/video Recordings
_____ Erasing of audio/video tapes after _____ years.
_____ Data will be retained indefinitely in a secure location.
Where? _____
_____ Data will be retained until completion of specific course and then destroyed.

Electronic Data N/A
_____ Erasing of electronic data after _____ years.
_____ Data will be retained indefinitely in a secure location.
Where? _____
__X__ Data will be retained until completion of specific course and then destroyed.

14. Informed Consent Process: If you are using non-database sources (ie. real people),

a. What process will be used to inform the potential participants about the study details and to obtain their consent for participation?

_____ An information letter with a written consent form for participants; provide a copy.
__X__ An information letter with a written consent from director of institutions involved; provide a copy.
_____ An information letter with written consent from teachers in classrooms or daycare; provide a copy.

Other (specify):

b. Will participants be able to understand what you are telling them? If any participants in your study sample are not fluent in English, or otherwise might be unable to understand to what they are agreeing, **then full IRB review must be sought**.

Not Applicable, there are no specific participants since all data is public information.

15. All supporting materials/documentation for this application are to be submitted electronically to IRB@lindenwood.edu. Please indicate which appendices are included with your application. Submission of an incomplete application package will result in the application being returned to you immediately.

Checklist for those involving human participants (beyond previously gathered databases) -
I have included in my application:

_____ Recruitment materials: A copy of any posters, fliers, advertisements, letters, telephone or other verbal scripts used to recruit/gain access to participants.

_____ Information/Cover letters used in studies involving surveys or questionnaires.

_____ Data gathering materials: A copy of all surveys, questionnaires, interview questions, interview themes/sample questions for open-ended interviews, focus group questions, or any standardized tests used to collect data.

__X__ Consent form for participants;

I certify the information in this proposal is complete and accurate.

Malinda Meier	12-6-08
Signature of Primary Investigator	Date
Cindy Vitale	12/08/08
Signature of Dissertation Chair	Date
[signature]	12-08-08
Signature of Dissertation Committee Member	Date
Jennifer A White	12-8-08
Signature of Dissertation Committee Member	Date
[signature]	12/8/08
Signature of Dissertation Committee Member	Date

Adapted, in part, from LU Ethics Form 8/03
Revised 9/08