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# Long-Term Student Achievement of Students Attending a Year-Round School and a Traditional Calendar School in One Urban School Division in Virginia

April M. Bruce

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LONG-TERM STUDENT ACHIEVEMENT  
OF STUDENTS ATTENDING A YEAR-ROUND SCHOOL  
AND A TRADITIONAL CALENDAR SCHOOL IN  
ONE URBAN SCHOOL DIVISION IN VIRGINIA

A Dissertation Submitted to the

Faculty of

Lynchburg College

by

April M. Bruce

In Partial Fulfillment of the

Requirements for the Degree of

Doctor of Education

In Leadership Studies

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Lynchburg College

Lynchburg, Virginia

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## ABSTRACT

Bruce, April M., Ed.D. Lynchburg College, May 2014. Long-term Student Achievement of Students Attending a Year-round School and a Traditional Calendar School in One Urban School Division in Virginia. Under the direction of Dr. Roger Jones.

The purpose of this study was to compare the reading and math performance of students who attended a year-round elementary school to the performance of students who attended a traditional calendar elementary school in one small urban school division in Virginia. As a part of the study, the performance of these students was also examined as they transitioned into the same traditional calendar middle school to determine if year-round education had long-term effects on student achievement. Analysis of Virginia Standards of Learning (SOL) raw score data was used to determine the level of performance in reading and math for the students in grades three through eight.

Participants attending the year-round school were enrolled in the year-round program beginning in second grade. They performed lower than students at the traditional calendar school during third grade. By fourth and fifth grades they scored better than students from the traditional calendar school. As the achievement of these students was examined during middle school, it appeared that any gains made while attending the year-round elementary school were lost. The reading achievement of students from the year-round school dropped below that of students from the traditional calendar school during all three years of middle school and the gap widened each year. In math, the students from the year-round school did score slightly better than students from the traditional calendar school in sixth grade. However, in seventh and eighth

grade, students from the year-round school scored lower than students from the traditional calendar school. These results suggest that the students attending the year-round elementary school did benefit from the year-round calendar during their elementary years but the benefits did not last as they entered a traditional calendar middle school.

## DEDICATION

This doctoral study is dedicated to my husband, Maurice. His support and encouragement have made it possible for me to complete this journey. I also offer many thanks to my beautiful daughter, Morgan, who has been an independent and motivated teenager who has brought me so much entertainment and joy. My mother has been a source of support since I decided to attend college many years ago as a single mother of a delightful little boy. Without her encouragement and assistance I would have never been able to obtain any of my previous three college degrees.

I must also thank God for blessing me and bringing me so far. I strive to let His light shine through my work each day.

## ACKNOWLEDGEMENTS

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A very special thanks goes out to the best doctoral cohort for all of the memories, support, and friendship along the way. One special cohort member, Amy Huskin, has been my rock and sister through this entire journey. Amy is responsible for pushing me, keeping me focused, and for providing abundant comic relief.

I appreciate the support of my colleague and boss, Al Coleman, for helping me choose a topic to study and for respecting the work I do. He is one of the kindest and most professional people I know. I hope to serve as an inspiration to others in my school division to make lifelong learning a part of their lives.



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## CHAPTER I

### INTRODUCTION

The American education system is in the midst of a growing accountability movement. Reform efforts often include discussions about the school calendar. Research studies supporting year-round education (YRE) are numerous (Cooper, 2003; Kneese, 1996; JLARC, 2012; Lyttle, 2011; Roby, 1995; St. Gerard, 2007). Advocates of YRE argue that the amount of content knowledge lost over the summer causes significant problems for students, and a more balanced calendar can increase retention of academic content (Alexander, 2007; Fairchild, 2011; Kerry & Davies, 1998). There have also been studies that have found no significant difference between the overall achievement of students attending year-round and traditional calendars schools. However, these studies revealed that YRE benefits certain subgroups of students (McMillen, 2001; Wu & Stone, 2010).

The federal and state accountability systems in place for public schools change often and the stakes are very high; yet the traditional school calendar is still the majority (NAYRE, 2007). Students from across the country are returning to school each year experiencing summer learning loss (Ramos, 2011). Nearly all students lose math and spelling skills over the summer months, and economically disadvantaged children suffer significant reading skill loss over the summer months (Cooper et al., 2003).

The 2011 Virginia General Assembly directed the Joint Legislative and Review Commission (JLARC) to study the efficacy of year-round schools. The final report and recommendations were presented to the 2013 session of the General Assembly. JLARC

reported that in Virginia there are currently nine elementary schools operating on a year-round calendar. JLARC staff analyzed Standards of Learning (SOL) English and math scores of students in Virginia who attended year-round schools and traditional calendar schools. In examining data from 2001-2009 they found no major difference in performance on SOL tests by the general population. However, the researchers found a strong positive effect on the English and math improvement rates of economically disadvantaged students and black students who attended year-round schools. Researchers also determined that Hispanic students who attend year-round schools have higher improvement rates in English than the Hispanic students attending traditional calendar schools. Overall, the data presented in the study shows that black, Hispanic, and economically disadvantaged students benefit academically from attending a school with a year-round calendar (JLARC, 2012).

Elementary schools make up 77 percent of the year-round schools in the United States (NAYRE, 2007). The majority of these students involved in year-round elementary schools will attend traditional calendar middle schools since only 11 percent of year-round schools are middle schools (NAYRE, 2007). Transition into middle school is often difficult for some students regardless of school calendar. This is due to social, emotional, physical, and cognitive changes associated with their age and transition to a new school (Alspaugh, 1998; Andrews & Bishop, 2012; Bronstein et al., 1996; Rosenblatt, 2008). There appears to be a gap in the research related to the achievement of students who attended a year-round elementary school and transitioned into a traditional calendar middle school. This study will help to determine if there are long-term benefits to YRE.

### *Statement of the Problem*

Is student math and reading achievement better for students who attend a year-round elementary school? As students who attended a year-round elementary school and a traditional calendar elementary school transition into a traditional calendar middle school, is there a difference in the math and reading achievement of the students?

There is a large body of research related to the achievement of students attending year-round schools. The research findings are mixed, but a common theme can be found throughout numerous studies. Students in certain subgroups such as, black, Hispanic, and economically disadvantaged, tend to benefit most from YRE (Cooper, 2003; Kneese, 1996; JLARC, 2012; Lyttle, 2011; Roby, 1995; St. Gerard, 2007). Even with these findings there are still issues in place that make it difficult for school divisions to switch to a year-round calendar. These include issues associated with politics, policies, and tradition.

School start legislation in Virginia dictates when schools can start each year which makes adjusting the school calendar difficult. Virginia is only one of only three states that require schools to start after Labor Day. Virginia does grant waivers to school divisions who qualify under at least one of the four “good cause” provisions. To qualify for a waiver in Virginia, a school division must have missed a specified excessive amount of days due to weather, energy shortage/failure, or other emergencies; have a school that is dependent on another school that has the waiver; have an approved experimental or innovative program; or have a school division entirely surrounding it that does qualify for the waiver (VDOE, 2011).

As school divisions contemplate school reform initiatives, school calendar is likely to be a part of the discussions. School divisions must take student achievement, cost, and long-term benefits into consideration prior to making such a decision. There is research associated with achievement and cost, but there is a gap in the research related to long-term academic gains for students who have attended year-round school.

*Purpose of the Study*

The purpose of this study was to examine the impact that a year-round calendar and a traditional calendar may have on the math and reading achievement of elementary students. To gain further information, math and reading data for students who attended both types of schools were analyzed to see if there was a significant difference in the math and reading scores of students three years after leaving elementary school.

Standards-based instruction, high-stakes testing, and accountability have put school divisions across the country in reform mode. This study will determine if there are long-term benefits for students who have attended a year-round school in one central Virginia school division. There are currently five schools in the division where this study occurred that are interested in implementing a year-round calendar. The results of this study will help to guide the school division as it makes decisions about school reform efforts. The results of this study could provide information that would encourage the school division to look at a prekindergarten-grade 12 YRE model or to abandon YRE efforts.



### *Conceptual Framework*

A year-round school calendar has the same number of days as a traditional school calendar, typically 180. The structure of year-round schools varies, but the intent is to create a calendar with shorter, more frequent breaks (NAYRE, 2007). These breaks are known as intersessions, and for some school divisions they are used to remediate and/or enrich students. These intersessions can allow students to “catch up” before an entire school year is over and summer school is eminent (St. Gerard, 2007).

There are studies that suggest black, Hispanic, and economically disadvantaged students have increased achievement in year-round schools (Cooper, 2003; Kneese, 1996; JLARC, 2012; Lyttle, 2011; Roby, 1995; St. Gerard, 2007). The students appear to perform better due to the minimization of summer learning loss and the benefits of intersessions. The conceptual framework in Figure 1.1 indicates that although two schools have many similarities, the school calendar is a factor that can drive instruction, remediation, and student achievement.

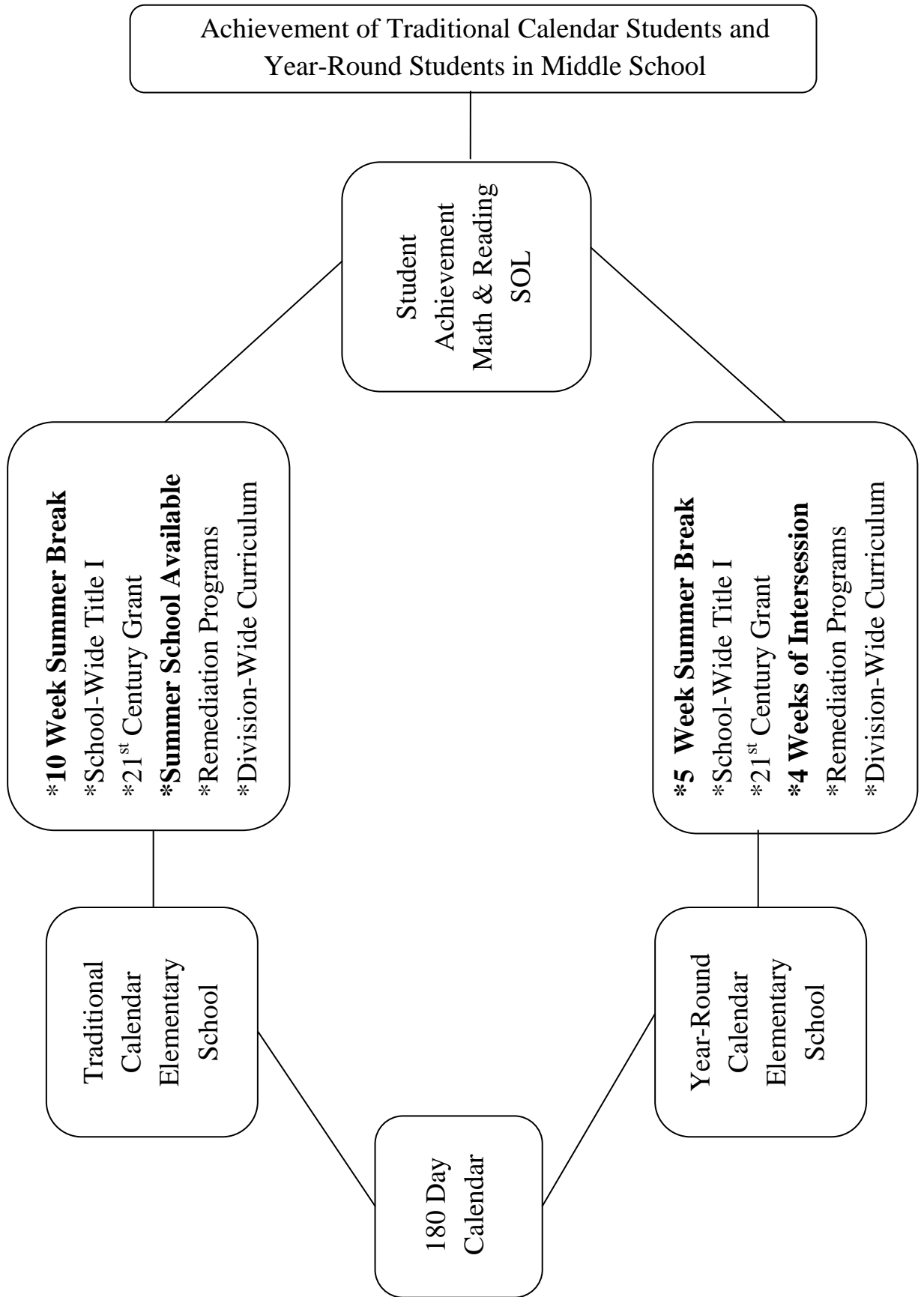


Figure 1. Conceptual Framework

*Significance of the Study*

This results of this study could help school divisions make better decisions about year-round school implementation or expansion. Results could lead school divisions to discuss YRE for students in grades prekindergarten-12.

### *Definition of Terms*

For the purpose of this study, the following terms were used:

*Economically Disadvantaged*- Students who receive free or reduced price meals or Medicaid or whose family qualifies for the Temporary Assistance for Needy Families (TANF) program due to having a low family income (VDOE, 2012).

*Extended Year School*- A school that provides more than 180 school days.

*Intersession*- Periods of time rescheduled from summer vacation and redistributed within the school year. They can be used as vacation but are usually utilized as instructional time for remediation and enrichment (Evans, 2007).

*Limited English Proficiency (LEP)*- Students who have difficulty speaking, reading, writing or understanding the English language (VDOE, 2012).

*Multi-track School*- is used primarily to alleviate overcrowding. Multi-track divides students and teachers into groups, or tracks of approximately the same size. Each track is assigned its own schedule. Teachers and students assigned to a particular track follow the same schedule and are in school and on vacation at the same time. Multi-track creates a "school-within-a-school" concept. **Example:** implementing a four-track year-round calendar extends the capacity of a school by 33%. A school with the capacity of 750 students can accommodate 1,000 students, as only three tracks of 250 would be in school at the same time; there would always be one track on vacation or intersession every day of the school year. A five track model (60-15) allows for a 25% gain in capacity (NAYRE, 2009).

*School Within a School*- a school that houses two academic programs, one operating under a year-round calendar and the other operating under a traditional school calendar.

*Single-track School*- provides a balanced calendar for a more continuous period of instruction. Students and all school personnel follow the same instructional and vacation schedule. Single-track does not reduce class size, nor does it allow a school to accommodate more students. The long summer vacation is shortened with additional vacation days distributed throughout the school year into periods called "intersessions." Intersessions allow time for remediation and enrichment throughout the school year. The most common types of single-track calendars are 45 days in school and 15 days of intersession, 60 days in school and 20 days of intersession, and 90 days in school and 30 days of intersession (NAYRE, 2009).

*Standards of Learning (SOL) Tests*- are tests required by the Virginia Department of Education. The tests are based on academic standards meant to establish minimum expectations for what students should know and be able to do at the end of each grade or course in reading, writing, mathematics, science, and history/social science (VDOE, 2012).

*Student Achievement*- The passing scaled scores on the Virginia Standards of Learning tests are one measure used to determine student achievement.

*Summer Learning Loss*- Academic regression for students after a traditional 10-12 week summer break (Kerry & Davies, 1998).

*Traditional Calendar School*- features a long summer vacation of 10-12 weeks followed by a long period of in-session days, with the first break coming at Thanksgiving. The winter holidays are followed by 55 in-session days before a short spring break. Spring break is followed by 40 work days before the end of the school year (NAYRE, 2009).

*Year-round Calendar*- reduces the long summer break and simply apportions those days throughout the school year, producing more frequent breaks and thus limiting long periods of in-session days, as well as longer vacations. (NAYRE, 2009).

*Year-round Education (YRE)*- A calendar with 180 days divided into instructional periods followed by intersessions or vacations. The summer break is shorter and the 180 days are reorganized for continuous learning (Kneese, 1996).

*Year-round School*- An individual school that operates on a year-round calendar.

### *Organization of the Study*

The study is organized and presented in five chapters, and includes references and appendices. Chapter I provides background information, a statement of the problem, the purpose of the study, the significance of the study, and the definitions of specific terms used in the study. Chapter II provides an introduction to the chapter, a review of the literature, and an explanatory summary of the current body of research related to the current impact of year-round schools on student achievement. Chapter III introduces the research design, details school profiles and participants, and provides information on data collection procedures. Chapter IV contains the analysis of the data. Chapter V provides a summary of the findings and recommendations.

## CHAPTER II

### REVIEW OF THE LITERATURE

#### *Introduction*

The purpose of this chapter is to provide a foundation for this study by reviewing and analyzing important literature related to the academic success of students attending year-round and traditional calendar schools. Specifically, this chapter will examine the history of the school calendar, definition of year-round education, summer learning loss, the effect of year-round education (YRE) on student achievement, costs associated with YRE, and transitioning from a year-round elementary school to a traditional calendar middle school.

#### *History of the School Calendar*

The American school calendar has varied greatly for over 350 years. It has been based on weather, agricultural responsibilities, English language needs, and child care assistance for factory workers. The most common calendar, known as a traditional calendar, is a September through June calendar that was initially established in the early 1800s when America's economy was based on agriculture (Lyttle, 2011). Early American dame schools in New England held classes during the seven warmest months of the year to avoid school during the bitter cold winters (Johnson, 1904). While traditional calendar schools have been the norm for centuries, there was evidence of year-round schools in Dorchester, Massachusetts as early as 1645. Not only did students in that school division attend year-round, but they attended school for ten hours a day

(Johnson, 1904). During the 1800s, many northern cities with expanding industries turned to year-round schools to take care of the children of workers and to teach the children of immigrants the English language. By the turn of the century, year-round schools in many cities were seen as a necessity due to overcrowding and the need to improve the education of children (Hermansen & Gove, 1971). At the end of World War II, the traditional nine month calendar, which consisted of 180 instructional days that were six hours long, became the norm across the United States (Lindsay-Brown, 2010). While this calendar was embraced by farming families, it was also very popular among some city dwellers. Wealthy families in large cities fled during summer months to escape the heat, expanding communicable diseases, and poor sanitation (Fairchild, 2012).

During the 1960s, the notion of year-round schools became a topic of conversation again. The multi-track year-round school calendar was a quick solution to ease overcrowded schools. In 1972, educators and advocates for year-round schooling met and established the National Association for Year-Round Education (NAYRE, 2007). Over the next two decades, school divisions across the country adopted a multi-track year-round calendar as a way to gain additional instructional space needed to house the large numbers of school age children. California led the way, and versions of the multi-track approach began to spread throughout the country (Glines, 1997).

In 1983, the National Commission on Excellence in Education released the report, *A Nation At-Risk: The Imperative for Educational Reform*. This report sent a sense of urgency across the country because it indicated that American schools were falling behind. It was noted that test scores for American students were on the decline, curriculum rigor was rare, and the education system had minimal requirements for

graduation. Recommendations to increase rigor, graduation requirements, and time in school were made. The report noted that students in England had a 220 day school calendar and spent eight hours per day in school, while American students had a 180 day school calendar and spent six hours per day in school (Gardner, 1983). As school divisions began planning ways to raise the bar for students, year-round schooling was again a topic of conversation around many board tables as they worked to find ways that could improve student achievement.

Gardner (1983) reported that the curriculum used in America was outdated and lacked the rigor necessary for students to compete globally. He blamed America for being complacent and said America had dismantled support for public education and was responsible for educational disarmament. This harsh language contained in the *A Nation At Risk* report was responsible for the level of attention it received. One of the most critical pieces of the report addressed the course work and curriculum being taught (Gardner, 1983). Throughout the 1980's and 1990's the focus in education was on graduation requirements, rigor, and curriculum. The states took on this responsibility with a push from the federal government (United States Department of Education, 2008).

When President George Bush, Sr. took office he began plans to hold a bipartisan education summit with governors from across the country. In September 1989, the Education Summit was held in Charlottesville, Virginia. During this summit, the groundwork was laid for the National Education Goals which later became a part of the Goals 2000: Educate America Act (Vinovskis, 1999). The Goals 2000: Educate America Act was signed into law on March 31, 1994. The intent was to provide resources to states and communities to assist students in reaching their greatest potential. The law was



based on eight education goals concerning school readiness, school completion, student academic achievement, leadership in math and science, adult literacy, and safe and drug-free schools, teacher professional development, and parental involvement. Along with this law came funding to help with systematic education reform efforts (Paris, 1994).

In January 2001, the No Child Left Behind Act was signed into law by George W. Bush. With this law came greater accountability for schools and a charge for the academic success of all students. Schools not meeting the requirements were forced to put prescribed, corrective actions in place. These strict requirements and sanctions have thrust remediation, after school programs, and summer school into nearly every school division in the country. The vast majority of these programs appear to be reactionary efforts for which students do not qualify until they fail (Borman & Boulay, 2004). Year-round schools have increased by 441 percent since the mid-1980s. An increasing number of school divisions are implementing year-round calendars for the schools that are facing sanctions as a way to increase student achievement (NAYRE, 2007).

Year-round schooling has many supporters but also has critics. The National Association of Year-Round Education and state education departments across the country strongly support year-round education because of the benefits for student achievement (NAYRE, 2007). Fairchild (2011) notes that one of the most vocal critics continues to be the International Association of Amusement Parks and Attractions. Their intense lobbying efforts work to ensure that traditional calendars stay in place so they will have more customers and minimum wage workers available during the summer season. This association also funds the Coalition for the Traditional School Calendar. This group, of mostly middle and upper-income families, fights hard to keep traditional calendars in

place to protect their extended “family time” each summer. Other critics include local, state, and federal politicians who are not willing to increase education spending for intersessions to educate students 30 or more extra days a year (Fairchild, 2011).

### *Defining Year-Round Education (YRE)*

The definition of year-round education means to reorganize the school year to provide more continuous learning by breaking up the long summer vacation into shorter, more frequent breaks or 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 (NAYRE, 2012). This type of calendar is also called a “balanced calendar.” The majority of year-round calendars and traditional calendars include 180 days of instruction. The year-round calendars distribute shorter, more frequent breaks throughout the year. Most year-round schools offer intersessions during these breaks to students who may need extra remediation or enrichment (McMillen, 2001). Proponents of YRE raise concerns about summer learning loss and low academic performance of students who attend school under the traditional school calendar (Cooper, et al., 2003).

The structure of year-round calendars varies greatly. In the most common structure, students attend school for 45 days and then break for 15 days (McMillen, 2001). Other models include 60 days of instruction and a 20 day break or 90 days of instruction and a 30 day break (Opheim, 1995). There are two major year-round configurations, and they are typically used for different purposes. The multi-track schedule is used to relieve overcrowding, and the single-track schedule is used for reform efforts. Kneese (1996) found that achievement in year-round schools is slightly higher

than in traditional calendar schools and that students in single-track year-round schools perform better than those students in multi-track year-round schools.

Multi-track schedules are typically put in place to ease overcrowding or to reduce class size. Students are able to attend school when another group of students are on break. For example: if there are four different tracks of student groups at the school, one-fourth of the students would always be on break. This allows for larger student enrollment without extra needed space (St. Gerard, 2007).

Single-track schedules, in most cases, are a division's first step in implementing a year-round school. It is normally a part of a reform effort with a focus on student achievement (Kneese, 1996). The goal for many schools is to build intersessions into the calendar and encourage as many students as possible to attend. When students attend intersessions they receive instructional days beyond the 180 day requirement, thereby increasing their exposure to academic content (McMillen 2001). This becomes a budgetary consideration for school divisions because teachers and staff must be paid to work the extra days. A school calendar exceeding 180 days is often referred to as an extended year calendar. All of these non-traditional schedules have a common priority, stop summer learning loss and increase student achievement (Lindsay-Brown, 2010).

### *Summer Learning Loss*

Most Americans have similar childhood memories of fun-filled summer vacations where schools were closed for nearly three months. The summer vacation for some students across the country has been significantly reduced due to the adoption of year-round calendars which limit extended time out of school (Gerard, 2007). This practice is more in line with the breaks students are given in other nations (Borman, 2004).

Table 1  
*Summer Break Lengths in Selected Countries*

Country	Summer Break (weeks)
<b>U.S. year-round</b>	<b>4-5</b>
Japan	4-5
Netherlands	6
Norway	8
Luxembourg	8
Austria	9
Italy	12
<b>U.S. traditional</b>	<b>12</b>

Source: JLARC staff analysis of the United Nations Educational, Scientific, and Culture Organization and Education, Audiovisual and Culture Executive data, 2012.

The primary reason school divisions have given for the implementation of a year-round calendar is summer learning loss (Cooper *et al.*, 2003). Advocates contend that shorter, more frequent breaks will decrease summer learning loss and promote student achievement (Ramos, 2011). Cooper *et.al* (2003) notes that the traditional school calendar contributes significantly to the achievement gap among wealthy and poor students because their summer activities vary greatly. Wealthier students have access to resources that can help them expand their academic knowledge while their poorer classmates may not have this same access (Fairchild, 2011).

Cooper *et al.*'s meta-analysis of 39 studies concerning summer learning loss focused on the effects of summer vacation on achievement. Findings indicated that summer learning loss equaled one to three months of instruction. This varied among subject areas, with the most significant loss in math and spelling. Cooper *et al.* (2003) indicated significant findings about the negative impact of summer vacations related to

learning. Long vacations break the rhythm of instruction and lead to students forgetting material. Students with special educational needs suffer significant loss over a long summer break. Students who have Limited English Proficiency (LEP) often lose the most ground because they are exposed to very little English while on a break from school. There was also evidence suggesting that the negative impacts are uneven based on socioeconomic status and that lower socioeconomic students are at a greater risk of increased summer learning loss (Cooper *et al.*, 2003).

Students considered at-risk or from low income families were found to have significant summer loss in all academic areas and tend to lose up to twice as much ground as other students in reading. In mathematics, all students lose ground including those from low income families (Kerry, 1998). Fairchild and Boulay (2002) noted that as students get older, the learning loss accumulates and puts students further behind. They found that low income, fifth graders are nearly two years behind their peers in reading due to accumulated summer learning loss.

A year-round schedule can be a better use of time and resources. Students are not out of school for eight to twelve weeks and not as likely to experience summer learning loss. The teachers, in turn, do not have to spend six weeks reviewing content from the previous year that students have forgotten (St. Gerard, 2007). Those who oppose year-round calendars argue that changing the calendar does not address other serious issues in education such as the lack of effective instructional methods, poor parental involvement, and weak curriculum. They also argue that more frequent breaks will cause learning loss throughout the year (Cooper *et al.*, 2003).

*Year-Round Education and Its Effect on Student Achievement*

The purpose of schooling is student achievement regardless of what school calendar has been established. There have been numerous studies comparing the achievement of students in year-round schools and traditional schools. While some studies find higher student achievement in year-round schools, the results vary. There are studies that have found no significant differences in the achievement of students regardless of the school calendar.

Several studies have shown increased student achievement for students who attend year-round schools. Cooper et al. (2003) conducted a study of school divisions operating under a year-round calendar. Out of 58 school divisions that contributed results, 36 reported positive effects on math and reading achievement and 22 revealed negative effects on math and reading achievement. The positive effects were minimal for all groups except for those identified as economically disadvantaged or poor-achieving. These students showed significant academic improvement when attending a school with a year-round calendar.

The Joint Legislative Audit and Review Commission (JLARC) submitted a report to the Virginia General Assembly and Governor about year-round schools in Virginia. JLARC studied the math and reading achievement of students in year-round elementary schools as indicated by Standards of Learning (SOL) tests. These scores were compared to the SOL math and reading scores of elementary students attending traditional calendar schools. The results indicated that there is no appreciable difference between the SOL reading and math scores of students attending year-round and traditional calendar schools. However, when the data was analyzed for specific subgroups of students, it was found that black, Hispanic, economically disadvantaged, and Limited English Proficient

students attending year-round schools perform better on SOL reading and math tests than their peers who attend traditional calendar schools (Joint Legislative Audit and Review Commission, 2012).

Roby (1995) conducted a study of the math and reading achievement of sixth grade students at two elementary schools in Ohio. One school was a year-round school and the other was a traditional calendar school. Only students who had attended the school for three consecutive years were used in the study. Roby found a significant statistical advantage for students attending a year-round school and even suggested that male students seemed to benefit more than female students.

Kneese (1996) conducted a meta-analysis of 15 studies that compared achievement of students attending year-round and traditional schools. Only one school was a grade 7-9 middle school; the other schools were elementary schools. The finding was that YRE had a positive, yet small, effect on student achievement. Males and economically disadvantaged students found the most success. Kneese also found that students who attended single-track schools performed higher than those students in multi-track schools. In another study, students in year-round schools were found to have higher state test scores and grade point averages and as an added bonus, students' attitudes toward school and teacher morale were better (Lyttle, 2011).

In a large study of over 345,000 students in grades 3-8 in North Carolina schools, results from the state End of Grade (EOG) tests in math and reading tests were analyzed (McMillen, 2001). Of the schools studied, 1,364 were traditional calendar schools, 67 were year-round calendar schools, and 39 were considered school-within-a-school. McMillen (2001) found that student achievement in year-round schools was not higher

Than achievement in traditional calendar schools. However, there was some indication that year-round calendars may be beneficial for some lower achieving students (McMillen, 2001).

An extensive six-year study of 4,569 schools in California looked at the student Academic Performance Index (API) scores of students attending year-round and traditional schedule schools. Of the schools studied, 4,043 were traditional calendar schools, and 526 were year-round schools. Most of the year-round schools in California are multi-track. As API scores were analyzed, results showed that year-round schooling did not affect the outcome or growth of API scores (Wu & Stone, 2010).

While contradictory results related to YRE exist, there is one aspect that is a common thread among all studies. Single-track YRE does seem to provide benefit to students from specific subgroups. This premise was reaffirmed in a study released by JLARC. JLARC's review determined that some groups of students had higher academic success in year-round schools. Black students in particular performed better on state Standards of Learning (SOL) tests when they were enrolled in year-round, single-track schools. Hispanic and economically disadvantaged students also appeared to do better in year-round schools but not as consistently as black students. This study also mentions additional costs associated with YRE being a factor for divisions to consider (Meola, 2012).

#### *Costs Associated With Year-Round Education*

As schools divisions consider YRE it is important to understand associated costs. The costs will vary depending on program design. If students are required to attend intersessions, that adds cost. In a study by Dorsett (2000) of single-track year-round and



traditional calendar schools, it was determined that year-round schools spent more per pupil than in traditional calendar schools. More specifically, for each one percent gain in mathematics achievement an additional fourteen dollars was spent per pupil (Dorsett, 2000). For each one percent gain in reading achievement an additional eight dollars was spent per pupil. Operating a single-track year-round school is more costly than a traditional calendar school due to maintenance, administrative, and salary costs (Lyttle, 2011).

A study of the cost of operating single-track year-round schools in Virginia was conducted by collecting data from 16 schools that have or are currently operating on a year-round calendar. It was determined that a year-round school costs about three percent more to operate. This does not include transportation costs. The majority of the additional expense is due to the need to provide materials and teacher compensation for intersessions. This increased cost has caused some school divisions in Virginia to discontinue their year-round schools (JLARC, 2012).

Multi-track YRE provides cost savings because more students can enroll without the high costs of building additions or new schools (Morton, 1994). Multi-track schools offering four tracks can serve 25 percent more students and will use a school building for 240 days instead of the traditional 180 days (Openheim, 2001). A switch to multi-track year-round school will likely increase enrollment which allows for cost savings. Total costs are reduced by 7.5 percent, or \$400 per student, due to efficiencies in capital and operations (Daneshvary & Clauretje, 2001).

Opponents of YRE argue that the cost to the travel and entertainment industry because of year-round schools is significant. Their claim is that minimum-wage

employees are not available during peak times because they are in school, and families do not travel when school is in session. These opponents propose to the public that YRE damages the economy of communities (Ballinger & Kneese, 2006).

School divisions should consider their population and the needs of the community, as well as available funding, before making changes to the school calendar. If a community is facing overcrowding, perhaps a multi-track year-round school will alleviate the problem and save money. If a school is exploring reform efforts, a single-track year-round school may provide additional support to students. School divisions should be aware of the variety of calendar options and conduct a thorough cost analysis prior to making significant calendar changes.

#### *Transition from a Year-Round Elementary School to Traditional Calendar Middle School*

The majority of schools following a year-round calendar are elementary schools. In 2007, it was reported that there were 2,764 year-round schools. Of all of the public year-round schools, 77 percent were elementary schools, 11 percent were middle schools, 9 percent were high schools, and 3 percent were classified as specialized schools. There were a total of 2,024,950 students attending year-round schools (NAYRE, 2007). Based on these statistics many elementary students who have been attending a year-round school will enter a middle school with a traditional calendar. The question is, “Do the benefits of YRE stick?” There is a research gap concerning the transition from a year-round elementary school to a traditional calendar middle school. However, there is a significant amount of research about middle school transition.

Alspaugh (1998) states that students have a significant achievement loss when transitioning from elementary school to middle school, especially during the sixth grade

year. This transition is even more difficult when students from several elementary schools merge into one middle school (Alspaugh, 1998). Middle school experiences have been found to correlate strongly with high school graduation rates which makes this time very important (Andrews & Bishop, 2012). Middle school is a time when students are going through social, emotional, cognitive, and physical changes adding to the stress of transitioning to a new school (Andrews & Bishop, 2012). Declines in grade point averages have been found in students from all racial groups as they transition to middle school. Hispanic students saw the greatest decline, followed by black students (Rosenblatt, J. 2008). Bronstein et al. (1996) found that lower-income children suffered a drop in grade point average and saw increases in internalizing or externalizing behaviors more than high-income children. Once again, income level has a significant impact on student achievement.

The configuration of middle schools differs greatly. The majority of middle schools across the United States serve students in grades six through eight. There are also schools that serve students in grades seven and eight, and kindergarten through grade eight (West, 2012). In a study of more than 345,000 students in Miami-Dade County, Florida, it was determined that students attending kindergarten through grade eight schools have far fewer negative effects related to transitioning than students who enter middle school in grades six or seven. Overall results of the study indicate that the kindergarten through grade eight configuration is better for students (West, 2012).

While there are not as many middle schools following a year-round calendar as elementary schools, transition to middle school seems to be a problem for many students regardless of the type of calendar they followed in elementary school (West, 2011).

More important than the configuration of middle schools is the need for strong transition plans to be in place to minimize negative effects of transition (Wormeli, 2011).

### *Summary*

This review indicates that year-round calendars provide some students with measurable increases in academic performance. In general, the conclusion is that the positive outcomes are equal to, or better than, those accomplished under the traditional school calendar. This is true for all students, but the benefits for students who are disadvantaged benefit to an even larger extent. The literature related to summer learning loss due to long summer breaks is significant. The loss of content knowledge for disadvantaged students is far greater than that of their non-disadvantaged peers, exacerbating the achievement gap more with every summer vacation.

Before school divisions embrace year-round schools, it is important to have a purpose for the change. This will help determine whether a multi-track calendar is needed to address overcrowding, or a single-track program is needed for a reform effort. The evidence is clear that YRE benefits some students, especially minority and disadvantaged students. Divisions with high numbers of minority and disadvantaged students should carefully explore the feasibility of implementing year-round schools. The next chapter will address the methods that will be used to determine academic achievement in reading and math for students attending a year-round elementary school and a traditional calendar elementary school who both feed into the same traditional calendar middle school. Their achievement in elementary and middle school will be examined.

## CHAPTER III

### METHODOLOGY

#### *Introduction and Research Design*

A review of research has determined that many students in America have been disadvantaged by the traditional school calendar that was designed around the needs of a country that was heavily reliant on farming (Lyttle, 2011). This quantitative, longitudinal study was meant to examine the academic performance of elementary students attending a year-round school and elementary students attending a traditional calendar school in an urban school division in Virginia. Their achievement in reading and mathematics, as demonstrated by performance on state Standards of Learning (SOL) tests was analyzed and compared to determine whether school calendar impacts student achievement. The historical SOL reading and mathematics test scores were collected for these students beginning in grade three and continuing through grade eight.

#### *Research Hypotheses*

This study examined whether or not a year-round calendar promoted higher student achievement than a traditional school calendar.

*Research Hypothesis I:* There is a significant difference in elementary SOL reading test scores between students attending a year-round school and a traditional calendar school. The students attending the year-round school will score higher on the SOL reading tests than students attending a traditional calendar school.

*Research Hypothesis II:* There is a significant difference in elementary SOL mathematics test scores between students attending a year-round school and a traditional calendar school. The students attending the year-round school will score higher on the SOL math tests than students attending a traditional calendar school.

*Research Hypothesis III:* There is a significant difference in middle school SOL reading test scores between students who attended a year-round elementary school and a traditional calendar elementary school. The students that attended the year-round elementary school will score higher on the SOL reading tests than students attending a traditional calendar school.

*Research Hypothesis IV:* There is a significant difference in middle school SOL mathematics test scores between students who attended a year-round elementary school and a traditional calendar elementary school. The students who attended the year-round elementary school will score higher on the SOL math tests than students attending a traditional calendar school.

#### *School and Division Profiles*

The populations selected for this research study were from an urban school division in Central Virginia. The school division served an average of 8,170 students in 16 schools over the course of this study. An average of sixty-two percent of the students in the division were considered economically disadvantaged during this study. Students included in this study attended two pre-kindergarten through grade five elementary schools. One school has a year-round calendar and will be referred to as school Y and the other has a traditional school calendar and will be referred to as school T. The

students from both elementary schools attend the same middle school which houses students in grades six-eight. This middle school will be referred to as school M.

As shown in Table 2, Elementary School Y operates under a year-round calendar that minimizes the time off in the summer. School begins in July and there are four weeks of intercession throughout the school year and traditional breaks for winter and spring holidays. School ends in early June and students have five weeks of summer vacation. Elementary School T and Middle School M both operate under a traditional calendar where there are breaks for the winter and spring holidays. The summer break is ten weeks long.

TABLE 2  
*School Calendar Distribution*

School	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	March	April	May	June
Y Elem.	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
T Elem.			-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
M Middle			-----	-----	-----	-----	-----	-----	-----	-----	-----	-----

School Y had, and continues to have, the highest poverty rate out of all 16 schools in the division. In the summer of 2003, the year-round calendar was adopted for full implementation during the 2004-05 school year. When the calendar was adopted, teachers were given the choice to transfer to a school with a traditional calendar. Some teachers and staff did choose to transfer, leaving behind those who were committed to the year-round educational experience.

School Y had an average of 284 students during this study. The racial makeup of the school during this study was 90% black, 6% white, 0% Hispanic, 0% Asian, and 4% two or more races. Of the 260 students, 94% received free or reduced lunch. Students

were required to wear uniforms. The average years of teaching experience for teachers at school Y during this study was 16 years. The school has 14 community partners and has had a 21<sup>st</sup> Century Community Learning Grant for ten years. The average class size during this study was 17.

The school was one of ten elementary schools in the division to qualify as a school-wide Title I school. Of all the schools with this designation, school Y receives the most Title I funding due to its very high poverty rate. They received an average of \$212,000 in Title I funding during this study. This paid for the salaries of reading specialists, instructional assistants, parental involvement activities, professional development, and instructional materials. The school also receive an average of \$180,000 per year in 21<sup>st</sup> Century Community Learning Grant funds during this study. This funding can only be used to fund programs which occur outside of the regular school day. It was used most frequently to provide students with specialized instruction during intersessions and for after school remediation and enrichment.

The services offered at school Y included a 180 day year-round school calendar which included four weeks of intersessions distributed throughout the year. They had a traditional winter and spring break. The summer break was five weeks long beginning in early June. During intersessions students with academic deficits were required to attend intersession. This was determined by performance on division-wide assessments. Those students not targeted for remediation were invited to attend other enrichment programs. Over 75% of the students participated. The intersessions were accompanied by a robust after school remediation/enrichment program available to all students. These programs were rich in experiential learning with hands-on activities, field trips, and guest speakers.



School T averaged 433 students during this study. The average racial makeup of the school during this study was 65% black, 26% white, 2% Hispanic, 2% Asian, and 5% two or more races. Of the 433 students, 71% received free or reduced lunch. Students were required to wear uniforms until the 2011-12 school year when it became optional. The average years of teaching experience for teachers at school T during this study was 12 years. The school had 12 community partners and has had a 21<sup>st</sup> Century Community Learning grant for seven years. The average class size was 20.

School T was another one of ten elementary schools in Lynchburg to qualify as a school-wide Title I school. They received \$190,000 in Title I funding each year during this study. This paid for the salaries of reading specialists, instructional assistants, parental involvement activities, professional development, and instructional materials. The school has received \$160,000 per year in 21<sup>st</sup> Century Grant funds for the past 10 years. This funding can only be used to fund programs which occur outside of the regular school day. It was used most frequently to provide students with Saturday, summer, and after school remediation and enrichment.

At school T, students followed a traditional 180 day calendar during the course of this study. This calendar had a traditional winter and spring break. Students had a ten week summer break. The school also had an after school remediation program and a three week summer program funded through the 21<sup>st</sup> Century Grant. Approximately 30% of the students participated in these programs.

School M had an average of 567 students during this study. The racial makeup of the school was 60% black, 30% white, 2% Hispanic, 3% Asian, and 5% two or more

races during this study. Of the 567 students, 66% received free or reduced lunch. The average years of teaching experience for teachers at school M during this study was 15 years. The school has seven community partners and has had a 21<sup>st</sup> Century Community Learning grant for seven years. The average class size was 17.

The school has received \$140,000 per year in 21<sup>st</sup> Century Grant funds. This funding can only be used to fund programs which occur outside of the regular school day. It was used most frequently to provide students with Saturday, summer, and after school remediation and enrichment.

At School M, students followed a traditional 180 day calendar. This calendar had a traditional winter and spring break. Students had a ten week summer break. The school also had an after school remediation program and a three week summer program funded through the 21<sup>st</sup> Century grant. Approximately 20% of the students participated in these programs.

All three of these schools are in the same urban school division. The division has 11 elementary schools, three middle schools, and two high schools. The division is located in Central Virginia in a city with 75,000 residents. There is one mid-size university, two small colleges, and one community college in the city limits. There is strong faith-based and community support for the schools.

TABLE 3  
*School Demographics & Support*

School	Total	Black	White	Two + Races	Other	Economically Disadvantaged	Title I	21 <sup>st</sup> Century Grant	Partners
Y Elem.	284	90%	6%	4%	0%	94%	√	√	14
T Elem.	433	65%	26%	5%	4%	71%	√	√	12
M Middle	567	60%	30%	5%	5%	66%		√	7

### *Participants*

Students who attended grades three through five at school Y and school T and continued on to grade eight at school M were the participants. The cohort of students who were in grade three during the 2005-06 school year were the focus of the study. The SOL reading and math results of these students were analyzed through grade five to determine if the year-round calendar increased the achievement of students who attended school Y. Further analysis of this cohort's SOL reading and math scores examined the SOL reading and math results for students from both elementary schools who attended school M to determine whether any significant achievement gains from elementary school continued throughout middle school.

### *Instrumentation*

The Virginia Standards of Learning (SOL) tests are criterion-referenced, state mandated and validated tests that were first administered in 1998 to students beginning in grade three. The tests are given in the core academic subjects of reading, math, writing, science, and history. For the purposes of this study only the raw SOL reading and math scores from the 2005-06 school year through the 2010-11 school year were used. The reason for this is that the tests were not changed since the 2005-06 school year for math and the 2006-07 school year for English. This will provide more consistency in the results.

The validity of the SOL tests is a top priority for the Virginia Department of Education. Committees of teachers and content specialists work in teams to develop the standards and associated test items. The items are field tested each year as they are

embedded into SOL tests. The validity of each question is determined prior to it being placed on a SOL test as an active test item.

SOL test scores are assigned band values. Scores below 400 are failing scores, scores of 400-499 are considered to be pass proficient, scores from 500-600 are classified as pass advanced. As large numbers of students complete SOL tests each year the tests are equated to determine appropriate cut scores to be used in score calculation. Raw scores are also reported and range from 0-50. For this study mean raw scores of students from each school were analyzed.

#### *Institutional Review Board (IRB)*

Prior to collecting data, approval for this study was obtained by the IRB. Approval documentation has been included as appendix A.

#### *Data Collection*

In this study the independent variable is school calendar. There are two types of schools in the study; year-round and traditional calendar schools. The dependent variables are SOL reading and math scores. The school Y, grade three cohort from 2005-06 included 34 students. The school T, grade three cohort from 2005-06 included 51 students. This grade three cohort of students was selected because this is the first year they take SOL tests so a baseline of SOL data was established.

Cohort rosters were closely examined to determine the specific students who attended grades three through five at each elementary school. The SOL reading and math scores were compared between students who attended school Y and school T to

determine if the year-round calendar improved student achievement. To extend the study, students who moved into school M and remained there until grade eight were identified. The SOL reading and math scores were compared between students who attended school Y and school T to determine if the students who attended school Y had higher academic achievement than those who attended school T.

The researcher serves as the school division's testing director and has access to division SOL data so no additional support was needed to secure data. The data is available as an Excel spreadsheet by unique student test identifier (STI) numbers to protect the identity of students. The data from 2002-present is available through Pearsonaccess.com.

### *Statistical Methods*

The Microsoft Excel Statistical Package was used to analyze the data in an effort to answer research hypotheses.

*Hypothesis I:* To analyze the elementary reading achievement scores of students in the cohort group from each school a matched-pair T-test was done. The key factor in the statistical T-test will be the P-value produced.

*Hypothesis II:* To analyze the elementary math achievement scores of students in the cohort group from each school a matched-pair T-test was done. The key factor in the statistical T-test was the P-value produced.

*Hypothesis III:* To analyze the middle school reading achievement scores of students in the cohort group from each school a matched-pair T-test was done. The key factor in the statistical T-test was the P-value produced.

*Hypothesis IV:* To analyze the middle school math achievement scores of students in the cohort group from each school a matched-pair T-test was done. The key factor in the statistical T-test was the P-value produced.

Further statistical analysis was conducted related to each hypothesis. This will be done through descriptive statistics.

#### *Limitations*

Although the research supports the notion that YRE leads to increased student achievement, several limitations associated with this study should be mentioned. First, the sample for this study was small and only included students from one school division. Next, student attending the year-round school only received YRE in grade two instead of grades kindergarten through two, prior to their performance on SOL tests being analyzed beginning in grade three. Other factors that may have impacted this study, which are beyond the scope of this project, are school culture, administrative support, and per pupil expenditures

One particular limitation of this study is that it did not address teacher efficacy. The variations in data at particular grade levels may suggest varying levels of instruction provided to students. Additional information related to teacher efficacy and student achievement could strengthen the study and help school divisions as they explore successful instructional strategies and school improvement initiatives.

Other variables that affect student achievement such as parental educational level, family background, nutrition, prenatal care, safe housing, and medical issues were not identified.

## CHAPTER IV

### RESULTS

#### *Overview*

The purpose of this study was to compare the reading and math performance of students who attended a year-round elementary school to the performance of students who attended a traditional calendar elementary school. As a part of the study, the performance of these students was examined in grades three through eight to determine if year-round education has long-term effects on student achievement. The study targets one group of students from a year-round elementary school (school Y) and one group of students from a traditional calendar elementary school (school T) beginning in third grade and continuing through eighth grade. Analysis of Virginia SOL raw score data was used to determine the level of performance in reading and math for these students in each grade. Each SOL test has 50 questions that are scored. The total number correct produces the raw score of 0-50.

The cohort of students from each elementary school began third grade during the 2005-2006 school year. Those students who transferred from their elementary school into the traditional calendar middle school (school M) remained in the study. Fluctuations in the numbers of students are a result of non-participation in SOL tests for that school year. This variance can occur in math and/or reading due to absences, testing exemptions permitted by Individualized Education Plans or Limited English Proficiency Plans, alternate testing offered by the Virginia Department of Education, or transferring to another school.



As the students transition into school M the number of participants decreased. While the majority of students from school Y and school T attend school M for grades six through eight, there are some students, based on their address, who are zoned to attend another middle school in the school division. Another factor is that there is a middle school in the school division that offers a magnet program and students from all elementary schools are eligible to apply to attend. Other factors such as those mentioned above also impact the numbers of students taking SOL tests from year to year.

#### *Summary of Elementary School Statistics*

Presented in Table 4 are the summary statistics for grade three. A total of 85 students were involved in the study of third grade performance on reading and math SOL tests. There were 51 students enrolled in the traditional calendar school (school T) and 34 students enrolled in the year-round school (school Y).

Table 4

#### *Statistics for Third Grade SOL Reading and Math Scores*

t-Test: Two-Sample Assuming Equal Variances

	<i>School T Reading 3</i>	<i>School Y Reading 3</i>
Mean	28.14	25.38
Variance	19.12	25.09
Observations	51	34
Df	83	
t Stat	2.68	
P(T<=t) two-tail	0.01	
t Critical two-tail	1.99	

t-Test: Two-Sample Assuming Equal Variances

	<i>School T Math 3</i>	<i>School Y Math 3</i>
Mean	43.67	41.00
Variance	25.15	33.76
Observations	51	34
Df	83	
t Stat	2.25	
P(T<=t) two-tail	0.03	
t Critical two-tail	1.99	

Presented in Table 5 are the summary statistics for grade four. A total of 81 students were involved in the study of fourth grade performance on reading and math SOL tests. There were 49 students enrolled in the traditional calendar school (school T) and 32 students enrolled in the year-round school (school Y).

Table 5

*Statistics for Fourth Grade SOL Reading and Math Scores*

t-Test: Two-Sample Assuming Equal Variances

	<i>School T Reading 4</i>	<i>School Y Reading 4</i>
Mean	27.16	27.63
Variance	30.31	22.31
Observations	49	32
Df	79	
t Stat	-0.39	
P(T<=t) two-tail	0.70	
t Critical two-tail	1.99	

t-Test: Two-Sample Assuming Equal Variances

	<i>School T Math 4</i>	<i>School Y Math 4</i>
Mean	35.08	38.25
Variance	70.29	56.84
Observations	48	32
Df	78	
t Stat	-1.72	
P(T<=t) two-tail	0.09	
t Critical two-tail	1.99	

Presented in Table 6 are the summary statistics for grade five. A total of 82 students were involved in the study of fifth grade performance on reading and math SOL tests. There were 50 students enrolled in the traditional calendar school (school T) and 32 students enrolled in the year-round school (school Y).

Table 6

*Statistics for Fifth Grade SOL Reading and Math Scores*

t-Test: Two-Sample Assuming Equal Variances

	<i>School T Reading 5</i>	<i>School Y Reading 5</i>
Mean	32.64	34.50
Variance	25.34	15.68
Observations	50	32
Df	80	
t Stat	-1.77	
P(T<=t) two-tail	0.08	
t Critical two-tail	1.99	

t-Test: Two-Sample Assuming Equal Variances

	<i>School T Math 5</i>	<i>School Y Math 5</i>
Mean	39.42	39.29
Variance	34.04	34.08
Observations	50	31
Df	79	
t Stat	0.10	
P(T<=t) two-tail	0.92	
t Critical two-tail	1.99	

Based on the reading results presented in Tables 4-6, the students at school Y scored significantly lower than the students at school T in grade three reading indicated by a significance level of .01. Students at school Y were performing in reading at nearly the same level as the students at school T by fourth grade as indicated by a significance level of .70. By fifth grade the students at school Y were scoring higher in reading than the students at school T with a significance level of .08.

Based on the math results presented in Tables 4-6, the third grade students at school Y scored significantly lower than the students at school T in grade three math indicated by a significance level of .03. Students at school Y performed better in math than the students at school T by fourth grade as indicated by a significance level of .09.

By fifth grade the students at school Y performed nearly the same in math as the students at school T with a significance level of .92.

*Summary of Middle School Statistics*

Presented in Table 7 are the summary statistics for grade six. The students included are students who transitioned into middle school M from elementary schools T and Y. The sample size decreased due to the number of students from school Y and school T who actually enrolled in school M. A total of 36 students were involved in the study of sixth grade performance on reading and math SOL tests. There were 23 students enrolled in school M from the traditional calendar school (school T) and 13 students enrolled in school M from the year-round school (school Y).

Table 7

*Statistics for Sixth Grade SOL Reading and Math Scores*

t-Test: Two-Sample Assuming Equal Variances

	<i>School T Reading 6</i>	<i>School Y Reading 6</i>
Mean	36.96	35.92
Variance	22.86	32.08
Observations	23	13
Df	34	
t Stat	0.58	
P(T<=t) two-tail	0.56	
t Critical two-tail	2.03	

t-Test: Two-Sample Assuming Equal Variances

	<i>School T Math 6</i>	<i>School Y Math 6</i>
Mean	34.55	35.00
Variance	79.50	49.09
Observations	22	12
Df	32	
t Stat	-0.15	
P(T<=t) two-tail	0.88	
t Critical two-tail	2.04	

Presented in Table 8 are the summary statistics for grade seven. The students included are students who attended school M in sixth grade and elementary schools T and Y. A total of 35 students were involved in the study of seventh grade performance on reading and math SOL tests. There were 21 students from the traditional calendar school (school T) and 14 students from the year-round school (school Y).

Table 8

*Statistics for Seventh Grade SOL Reading and Math Scores*

t-Test: Two-Sample Assuming Equal Variances

	<i>School T Reading 7</i>	<i>School Y Reading 7</i>
Mean	36.24	33.71
Variance	34.39	32.37
Observations	21	14
Df	33	
t Stat	1.26	
P(T<=t) two-tail	0.22	
t Critical two-tail	2.03	

t-Test: Two-Sample Assuming Equal Variances

	<i>School T Math 7</i>	<i>School Y Math 7</i>
Mean	31.33	27.71
Variance	108.23	97.30
Observations	21	14
Df	33	
t Stat	1.03	
P(T<=t) two-tail	0.31	
t Critical two-tail	2.03	

Presented in Table 9 are the summary statistics for grade eight. The students included are students from elementary schools T and Y who have remained at school M. A total of 38 students were involved in the study of eighth grade performance on reading and math SOL tests. There were 24 students from the traditional calendar school (school T) and 14 students enrolled in the year-round school (school Y).

Table 9

*Statistics for Eighth Grade SOL Reading and Math Scores*

t-Test: Two-Sample Assuming Equal Variances

	<i>School T Reading 8</i>	<i>School Y Reading 8</i>
Mean	34.00	33.64
Variance	48.78	46.55
Observations	24	14
Df	36	
t Stat	0.15	
P(T<=t) two-tail	0.88	
t Critical two-tail	2.03	

t-Test: Two-Sample Assuming Equal Variances

	<i>School T Math 8</i>	<i>School Y Math 8</i>
Mean	36.21	32.79
Variance	58.17	78.95
Observations	24	14
Df	36	
t Stat	1.26	
P(T<=t) two-tail	0.22	
t Critical two-tail	2.03	

Statistical significance, as indicated by P values, was not as evident when analyzing middle school data because of greater score variance and the sample size at the middle school was smaller due to the transition from elementary to middle school.

Based on the reading results presented in Tables 7-9, the students from school Y scored nearly identical to the students from school T in grade six reading indicated by a significance level of .56 and mean scores that only differed by 1.04. Students from school Y performed slightly lower than the students from school T on the seventh grade reading test as indicated by a significance level of .22 and a mean difference of 2.53. By eighth grade the students from both schools were performing at almost the same level in reading as shown by a significance level of .88 and a mean difference of .36.

Based on the math results presented in Tables 7-9, the students from school Y scored nearly identical to the students from school T in grade six math as indicated by a significance level of .88 and a mean difference of .45. Students from school Y did not perform as well as the students from school T by seventh grade as indicated by a significance level of .31 and a mean difference of 3.62. By eighth grade the students from school Y performed lower than the students from school T with a significance level of .22 and a mean difference of 3.42.

### *Results by Hypothesis*

This section provides the results for the four hypothesis stated in the previous chapter. The analysis of SOL reading and math data, through match-pair t-tests, provided the statistics necessary to determine the long-term differences in achievement for students who attended a year-round elementary school and a traditional calendar elementary school.

Research Hypothesis I: There is a significant difference in elementary SOL reading test scores between students attending a year-round school and a traditional calendar school. The students attending the year-round school will score higher on the SOL reading tests than students attending a traditional calendar school.

In Tables 4-6 the mean and p-value were used to determine the difference in reading achievement between students who attended a year-round elementary school and a traditional calendar elementary school. Findings only supported the hypothesis in grade five.

Research Hypothesis II: There is a significant difference in elementary SOL mathematics test scores between students attending a year-round school and a traditional

calendar school. The students attending the year-round school will score higher on the SOL math tests than students attending a traditional calendar school.

In Tables 4-6 the mean and p-value were used to determine the difference in math achievement between students who attended a year-round elementary school and a traditional calendar elementary school. Findings only supported the hypothesis in grade four.

Research Hypothesis III: There is a significant difference in middle school SOL reading test scores between students who attended a year-round elementary school and a traditional calendar elementary school. The students who attended the year-round elementary school will score higher on the SOL reading tests than students attending a traditional calendar school.

In Tables 7-9 the mean and p-value were used to determine the difference in reading achievement between students who transitioned to middle school (school M) from a year-round elementary school (school Y) and a traditional calendar elementary school (school T). Findings did not support the hypothesis.

Research Hypothesis IV: There is a significant difference in middle school SOL mathematics test scores between students who attended a year-round elementary school and a traditional calendar elementary school. The students who attended the year-round elementary school will score higher on the SOL math tests than students attending a traditional calendar school.

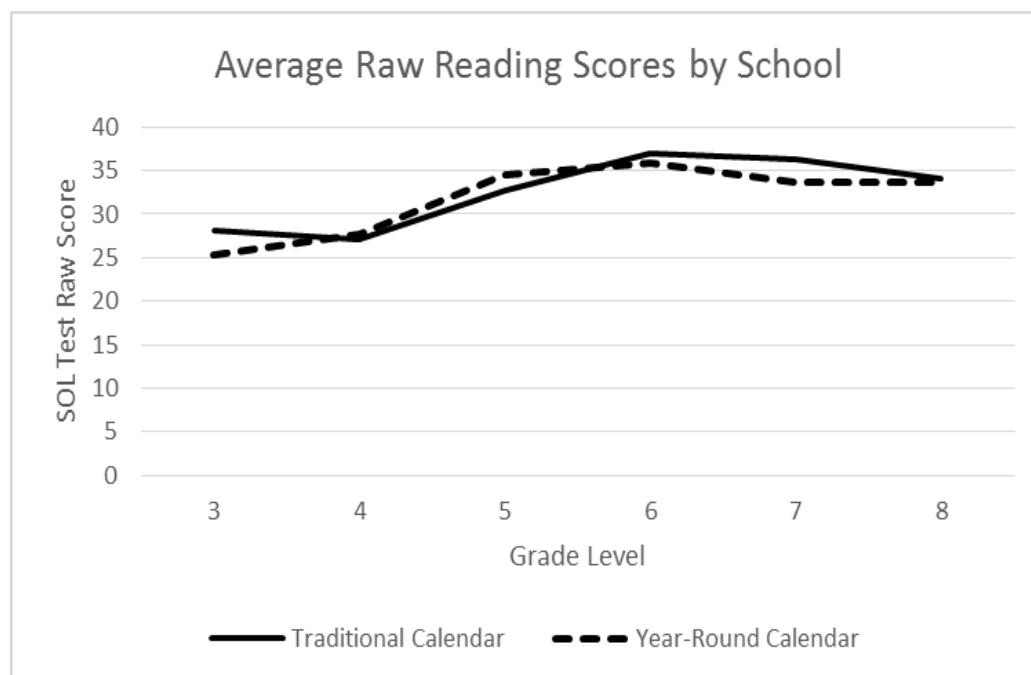
In Tables 7-9 the mean and p-value were used to determine the difference in math achievement between students who transitioned to middle school (school M) who



attended a year-round elementary school (school Y) and a traditional calendar elementary school (school T). Findings did not support the hypothesis.

#### *Overall Tendencies for Reading Achievement*

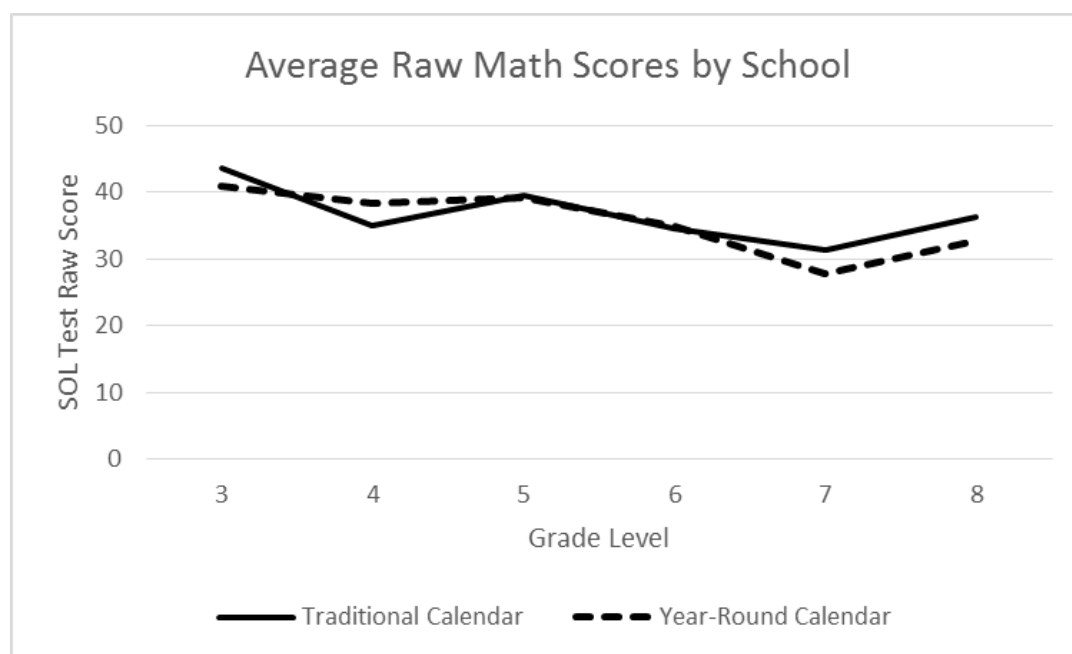
The analysis of SOL reading data from grade three through grade eight indicates that students who attended school Y performed lower than students who attended school T in grade three. By the end of elementary school, students who attended school Y performed better than the students who attended school T. As students transitioned from fifth grade to a traditional calendar middle school, the scores of students from school Y dropped slightly below those of students from school T. This trend continued in all three years of middle school. This is illustrated in Figure 2.



*Figure 2.* SOL Reading Scores for Grades 3-8

### *Overall Tendencies for Math Achievement*

The analysis of SOL math data from grade three through grade eight indicates that students attending school Y performed lower than students who attended school T in grade three. In fourth grade, students who attended school Y performed better than the students who attended school T. In fifth grade, students from both schools performed at nearly the same levels. As students transitioned to a traditional calendar middle school, the scores of students from both schools remained nearly the same in grade six. Students from school Y performed below those of students from school T in seventh and eighth grade. This is illustrated in Figure 3.



*Figure 3. SOL Math Scores for Grades 3-8*

Statistical analysis revealed that third grade students who attended the year-round school performed lower in reading and math than students who attended the traditional calendar school. There were increases in student achievement for students attending year-round school in grades four and five. As the students from both elementary schools

moved into middle school the performance from both groups of students was nearly the same the first year in grade six. In grades seven and eight the performance of the students who attended the year-round elementary school dropped below that of the students who attended the traditional calendar school. This trend is the case for both reading and math; however, the reading scores did not regress as much as they did in math for either group. The fact that school M provides students in regular level English with two periods of English instruction may be a factor. Students in regular level math only get one period of math instruction per day. The findings and recommendations will be discussed in detail in the next chapter.

## CHAPTER V

### SUMMARY, FINDINGS, IMPLICATIONS, AND RECOMMENDATIONS

#### *Summary*

The purpose of this study was to determine if there were long-term academic benefits for students who attended a year-round elementary school and transitioned into a traditional calendar middle school. Two groups of students were the participants in the study. One group of students attended a year-round elementary school and the other group attended a traditional calendar elementary school. Both elementary schools are in the same school division and the students from both schools are zoned to attend the same middle school. The SOL math and reading scores were analyzed beginning when these students were in third grade during the 2005-2006 school year. The SOL data for these students was examined from third grade through eighth grade to first determine if there was a difference in scores during elementary school and then to determine if differences existed as the students progressed into middle school.

Previous research related to the achievement of students attending year-round schools has mixed results. In a study done in North Carolina by McMillan (2001), it was found that year-round education has no impact on academic achievement. In a large meta-analysis of 39 studies of year-round schooling, it was determined that a year-round calendar had positive results for students who were economically disadvantaged, black, and for those with Limited English Proficiency (LEP) and special educational needs (Cooper *et al.*, 2003). The 2011 Virginia General Assembly directed the Joint

Legislative Audit and Review Commission (JLARC) to conduct a study on the efficacy of year-round schools. The study, released in 2012, found no significant differences in overall student achievement for students attending a year-round school. However, it was determined that certain subgroups of students do perform better in reading and math when attending a year-round school. The subgroups shown to perform better in year-round schools were economically disadvantaged, black, Hispanic, and LEP students (JLARC, 2012).

Summer learning loss seems to be the most convincing argument for year-round schools. Cooper *et. al* (2003) suggested that the traditional calendar contributes significantly to the achievement gap between wealthy and poor students because their summer activities vary so much. Kerry (1998) found that students living in poverty lost twice as much ground in reading as wealthier students and all students experienced some learning loss in math during the summer.

The number of year-round schools has decreased in Virginia from 31 in 2009 to only nine in 2012. The nine year-round schools currently operating in Virginia are all elementary schools and were put in place to improve the academic achievement of students (JLARC, 2012). Based on the findings of the JLARC study, the 2013 Virginia General Assembly authorized planning grants for school divisions of up to \$50,000 for the purpose of funding the planning for the implementation of year-round schools (Virginia Department of Education, 2013). This funding initiative may lead to more year-round schools in Virginia.

### *Findings*

In this study, both groups of participants had a large percentage of students classified as economically disadvantaged. At school Y, the year-round school, 94% of the students were economically disadvantaged. At school T, the traditional calendar school, 71% of the students were economically disadvantaged. Funding resources in both elementary schools were similar. Both schools received Title I funding and both had 21<sup>st</sup> Century Community Learning Grants. School Y implemented a year-round calendar when the students were in second grade. School T had a traditional calendar during the entire time the participants attended. The majority of students from each school were zoned to attend the same traditional calendar middle school.

The reading achievement of students at school Y was lower than the students at school T in third grade. In fourth grade, the reading achievement was slightly higher for students attending school Y. By fifth grade, the reading achievement for students at school Y continued to increase above that of students from school T. These results indicate that although students from school Y started off behind their peers at school T, they did make achievement gains and ended up outscoring students from school T by the time they left elementary school.

In math, the students from school Y scored lower than students from school T in third grade. In fourth grade, students at school Y scored higher than students from school T. In fifth grade, students from both schools scored nearly the same. Results from this study show that the students attending year-round school did have some positive gains in math achievement while in elementary school. Further research would need to be done to determine if this was strictly due to the school calendar or if other factors contributed to this demonstrated success.

As the achievement of these students was examined during middle school, gains made by students who attended the year-round elementary school were lost. The reading achievement of students from school Y dropped below that of students from school T during all three years of middle school and the gap widened each year. In math, the students from school Y did score slightly better than students from school T in sixth grade. However, in seventh and eighth grade students from school Y scored lower than students from school T. These results suggest that the students attending school Y did benefit from the year-round calendar during their elementary years, but these benefits did not last as they entered a traditional calendar middle school.

The transition to middle school has been found to cause a decline in grade point averages for students from all subgroups (Rosenblatt, 2008). In a large study of school configurations in Miami, Florida, it was determined that schools serving students in grades kindergarten through eighth grade were the most successful (West, 2012). Based on this research and the results of student achievement from school Y, it may be beneficial to explore reconfiguring the grade make-up in schools. In addition, the exploration of kindergarten through twelfth grade year-round schools may prove to be valuable.

### *Implications*

It is critically important to understand that for some students, summer learning loss can cause them to fall further behind each year. Research has shown that this is especially true for students in certain subgroups, such as economically disadvantaged, black, and English Language Learners. School divisions that have large numbers of students in any of these subgroups may need to explore ways to reduce or eliminate the

summer learning loss impacting these students. Year-round education and extensive summer programs with strong academic foundations are worthy of consideration.

In the school division where this study occurred, an examination of academic safety nets provided for students in all three schools should be examined. There were spikes in student achievement that should be further investigated. In grade four math at school Y, intensive intersessions targeting specific skill deficits for students were provided. These intersessions offered focused remediation and activities designed to promote problem solving. The participation rate for intersessions in fourth grade averaged 80 percent during this study. This targeted support for students in place at school Y in fourth grade math should be replicated at other schools. Although, due to calendar restrictions, it may not be possible to do this in an intersession format, perhaps summer, winter, Saturday, spring break, before school, and/or after school programs should be structured to focus on student specific skill deficits and problem solving.

The remediation program at school T only had a 30 percent participation rate. The remediation program at school M only had a 20 percent participation rate. These programs, funded through a 21<sup>st</sup> Century Community Learning Grant, focused on remediation and skill deficits. These programs were held after school and during the summer. Participation was lower than desired due to athletics, summer vacations, the lack of proximity to the school, and other activities. Creative scheduling of these remediation programs may help with increased participation and ultimately higher achievement for students in need of extra academic support.

There are currently five elementary schools in this school division interested in adopting a year-round calendar. The transiency rate at the elementary level averages



forty percent. Unless all eleven elementary schools adopted the year-round calendar this could cause transition issues as students moved between the two types of schools. The school division would need to determine if the short-term gains, as determined by this study, would be worth this level of restructuring. It may be necessary to explore options to expand the year-round school model into secondary schools or to become a year-round school division.

Expansion of year-round education would be costly. JLARC (2012) determined that the operational cost associated with a year-round calendar is three percent higher and transportation costs could go up 12 percent. School divisions would need to determine the number of year-round calendar schools they plan to implement and work to determine associated costs. These factors would need to be considered and funding would need to be secured or reallocated.

If funding restraints would not permit all schools to operate on a year-round calendar, perhaps consideration should be given to implementing a year-round calendar at all three middle schools in the division where this study occurred. The issue of transiency would not be as problematic with all three middle schools operating on the same calendar.

Based on this study, students from both schools had a decline in math achievement as they entered middle school, and in reading there was a slight decline in achievement for all students from grade six to eight. A year-round calendar or a robust summer program for students in middle school could provide a safety net for students to help better prepare them for high school. Further research would have to be done to

determine if older students also lose the academic gains made as they transition from a year-round calendar back to a traditional calendar.

Many things would need to be explored prior to a year-round calendar being implemented at the division level. There are very few secondary schools operating on a year-round calendar. Considerations regarding the overall scheduling of athletic, arts, and academic events could be problematic for schools as they compete against traditional calendar divisions. This issue could be a factor driving the rarity of secondary schools operating on a year-round calendar. Therefore, a feasibility study to determine any unintended, negative consequences related to a year-round secondary school calendar would be beneficial.

As sanctions are placed on schools based on the poor performance of students on high-stakes tests, year-round education is becoming a more popular topic. Implementation of a year-round calendar as an academic reform effort has been shown to help students in some subgroups. Federal, state, and local governments will need to continue to explore ways to provide all students with equal access to academic activities during the summer. Some students who make gains during the school year can be left with feelings of frustration when they discover that after a long summer break they return to school with significant loss of curriculum content. This deficit is exacerbated by each summer that passes.

#### *Recommendations for Future Study*

The research in the area of long-term student achievement of students attending year-round elementary schools is very limited. The need to expand the research in this area is vast. Further research could guide school divisions as they work to increase

opportunities for all students to make academic gains through the implementation of a school calendar that provides the most opportunity. This particular study could continue by examining the graduation rates for the students from each of the schools in this study. The participants who attended school Y and school T are expected to graduate in 2015.

A study of long-term student achievement for a school division with a year-round calendar for all students in grades kindergarten through graduation would be very interesting. If academic gains continued like they did for the fourth and fifth graders in this study, the impact on student achievement by implementing year-round education in kindergarten through graduation could prove to be very beneficial. The elimination of academic backslide would poise students to begin each school year on a more equal playing field which could ultimately reduce the achievement gap among certain subgroups of students.

While this study was small, a large study to include more students who transitioned from a year-round elementary school to a traditional calendar middle school may solidify the results of this study. A larger study across multiple school divisions would produce more students in a variety of subgroups so more focused conclusions could be made about their long-term achievement.

Another study that would help school divisions who are considering a year-round calendar would be one that could compare the readiness of students at the beginning of a school year who were attending a year-round school and those who were recently exiting a quality academic summer program. If the beginning of the school year readiness was similar, perhaps more research could be done on what elements an effective summer program should contain.

Efforts to provide equal educational activities for all students should be a priority. Creating a year-round school calendar, quality summer programs, or providing summer curriculum materials for all students at risk of summer learning loss would be a step in the right direction. The academic achievement of U.S. students, based on high-stakes testing, will continue to be compared to that of students from other countries. School calendar is one thing that differs greatly across the world. The U.S. may want to consider transitioning to a school calendar used by countries with higher rankings. Further research on the long-term impact of year-round education may help to guide reform across the country.

### *Conclusion*

Based on the results of this study, a year-round school calendar at the elementary level can help to increase student achievement. The calendar at school Y offers more frequent and shorter breaks with intersessions for students who may need additional academic assistance. This type of calendar helps to reduce summer learning loss that may be negatively impacting student achievement at schools with a traditional calendar.

While students who attended school Y made academic gains in reading and math in elementary school and outperformed students from school T, these gains were short-lived. When students from school Y were in middle school, their reading achievement fell below the students from school T in grades six through eight. In math, students from school Y scored lower than students from school T in grades seven and eight.

These results should prompt the school division to consider expanding year-round education and making it available to as many elementary students as possible. The school division would have significant work to do to assist students as they transition

into a traditional calendar middle school. The school division should consider year-round middle schools or the implementation of the types of safety nets that were present for students at the year-round elementary school. The elimination of extensive summer learning loss is a critical component that needs to be further addressed so students can begin each school year ready to move forward, instead of having to review material they have lost. Increases in student achievement would have a positive impact on school accreditation, the meeting of federal academic mandates, and most importantly, the preparation for students to become graduates who are college and career ready.

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## APPENDIX A

IRB Approval

To: Bruce, April M.

Date: November 12, 2012

Re: Verification of Research Proposal Exemption

Your request for review of your research project, “Long-term math and reading achievement for students attending year-round and traditional calendar schools”, has been completed. Upon reviewing the information you submitted, the Human Subject Research Committee has concluded that your research project qualifies for exempt from review status.

The proposal and related study comply with the criteria for exemption set by the U.S. Department of Health and Human Services, Code of Federal Regulations, Title 45 CFR Part 46, Protection of Human Subjects, effective as of July 14, 2009. The study is therefore exempt from review.

Please remember that if any modifications are necessary, these changes need to be approved by this committee. Please feel free to give me a call at X8962 if you have any questions.

Sincerely,

Beth McKinney

Beth McKinney, PhD, MPH, CHES  
Chair, Human Subject Research Committee (IRB)

CC: Dr. Sally Selden