

COMPARING TRADITIONAL AND YEAR-ROUND ACADEMIC CALENDARS IN
REGARD TO STUDENT ACHIEVEMENT IN TWO VIRGINIA HIGH SCHOOLS: IS
THERE A DIFFERENCE?

by

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Liberty University

A Dissertation Presented in Partial Fulfillment
of the Requirements for the Degree
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ABSTRACT

This study examined possible differences between a traditional and a year-round academic calendar with regard to student achievement in two suburban high schools in northern Virginia. This study's importance derives from the fact that additional exploration is needed in order to more fully explore the potential loss of learned knowledge and diminished retention and recall of instructional material in students who experience an extended summer vacation period as part of a traditional school calendar. The purpose of this non-experimental, ex post facto, causal-comparative study was to test the theory of German psychologist, Hermann Ebbinghaus, called the spacing effect as it related to a comparison of the traditional school calendar and a year-round school calendar. While existing research has suggested that a traditional calendar results in summer learning loss, the current study did provide some support to the assumption that a summer learning loss had a long term impact on the standardized test performance of students. In order to further examine this finding, a group of test scores from 100 seniors from each high school (for a total of 200), who shared similar demographic characteristics, were used to create the data set for the study. All the seniors from these two separate but similar high schools (located less than four miles apart) were required to take the end of year (EOY) Virginia standards of learning (SOL) test near the end of their senior year of high school. The SOL must be taken and passed in the spring of the senior year in order for a senior to graduate from high school. These schools employed different school calendars. One adhered to a traditional calendar, the other a year-round calendar. The Virginia Standards of Learning (SOL) assessment is a timed test comprised of four comprehensive sections (math, science, reading, and social studies). This study used a non-experimental, causal-comparative (ex-post facto) research design with the independent variable being split into two non-manipulated groups (one traditional

calendar and one year-round calendar), and the dependent variable being the pre-existing SOL test scores of the participants. Data were evaluated using independent-samples *t*-tests.

Suggestions for further research which would enhance the validity of this area of research are discussed.

Keywords: school calendar, year-round schooling, traditional calendar, student achievement, socioeconomic students (SES) students

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CHAPTER ONE: INTRODUCTION

Overview

This chapter will examine the background and development of various school calendar options. Included will be a clear statement of the problem and a defined purpose of the study. Mention will be made of the significance of the study and pertinent research questions. Definitions of related terms will also be provided.

Background

To ensure educational professionals are doing all they can to maximize student achievement, improvements in various components of education are continuously sought. One component of schooling that the research suggests deserves further study is the type of academic school calendar implemented in various schools (Crow & Johnson, 2010; McMullen & Rouse, 2012a). Some existing research documents a loss of knowledge, during the summer months, by students in the United States who attend school on the traditional school calendar. This loss occurs following the nine months of traditional calendar academic engagement (Ballinger & Kneese, 2006; von Hippel, 2009). Some school officials have chosen to avail themselves and their school districts of different calendar options in an effort to alleviate summer learning loss. This study examined and compared standardized test score data of students who attended school on the year-round calendar and students who attended on a traditional calendar to determine if any differences existed.

This chapter will examine the background and historical aspects of the development of various school calendar options, to include a clear statement of the problem and a defined purpose of the study. Mention will be made of the significance of the study, pertinent research questions that have been developed, along with corresponding hypotheses, an identification of

the variables, definitions, and a research summary. Chapter Two will incorporate a review of pertinent literature. Chapter Three will describe the methodology employed in the study, to include an explanation of the selected research design, the research questions and hypotheses, a description of the study participants, the setting, any instrumentation utilized, and the procedures used for data collection and data analysis.

Examining various school calendar options from a historical perspective, the traditional school calendar used in the United States public school system has its roots in an agrarian society. In such a society, the labor services of many school-aged children were required by their parents to help on the farm at critical times during the day and provide assistance with crop harvesting (Ballinger & Kneese, 2006). In the 1800s, educational reformers, Horace Mann and Henry Barnard, observed that a loss of student learning occurred when students were away from their school studies for extended periods of time (Gold, 2002). In fact, some research indicated when students have an entire summer for vacation (usually three months) a cognitive regression occurs (Alexander, Entwisle & Olsen, 2007; Downey, von Hippel, & Broh, 2004; Entwisle, Alexander & Olsen, 1997).

Pre- and post-test studies have been conducted to measure students' academic knowledge level on topics covered in the spring prior to leaving school and in the fall upon returning from the summer vacation (Alexander et al., 2007). Heyns (1978) concluded the length of summer vacation is too long to retain academic knowledge, and the amount of academic regression may be reduced if students did not spend a significant amount of time from studies. These summer learning losses have been referred to as the summer effect/slide/gap or the summer learning gap (Alexander, et al., 2007). Staying active in the learning process throughout the vacation period can prove beneficial in reducing cognitive regression (Hess, 2006). Despite these findings of

over two decades ago, many public schools in the United States continue to function on the traditional calendar. This can be attributed to a number of concerns, opinions and factors. Chapter Four of Charles Ballinger and Carolyn Kneese's 2006 book, *School Calendar Reform: Learning in All Seasons* employs a question and answer format that provides insight into these and many other concerns relevant to the process of changing from a traditional to a year-round school calendar. A century of summer vacations has created a culture of summer where freedom, family bonding, and valued rest and relaxation have become an integral part of the fabric of the American way of life. Many concerns are linked to this family life as opposed to being directly linked to student achievement or instructional concerns (Ballinger & Kneese, 2006). Some parents would not favor having multiple children on different school schedules, fearing that childcare arrangements could be disrupted and wonder if high school students could find part-time employment during non-peak vacation times (Ballinger & Kneese, 2006). A possible disruption to sports schedules and an increase in the costs of school air-conditioning, cleaning, and maintenance, are some of the additional concerns that drive the continuance of the use of the traditional school calendar. Despite these concerns, improving academic student achievement levels remains a priority within educational arenas and gives rise to the consideration of interventions that seek to alleviate said achievement losses, to include adjustments to school year calendars.

Deficiencies in student achievement have historically contributed to federal legislation being implemented, such as President George W. Bush's signing of the reauthorization of the Elementary and Secondary Education Act of 1965, known as No Child Left Behind, in 2002. This law sought to ensure that all states developed and implemented stronger accountability and measurement requirements for academic achievement (U.S. Department of Education, 2001).

Each state was required to specifically define Adequate Yearly Progress (AYP) for their school districts. Additionally, schools that fell under the auspices of federal Title I law, which meant those schools and or districts that were the recipients of some level of federal funding, also had to define AYP and were subject to annual reporting depicting progress made. The 2001-2002 state testing results formed a baseline for the U.S. Department of Education. Each state established its performance level baseline at the demographic group or the school within the state with the lowest academic achievement level. The state then raised that bar to a level of achievement that must be reached within a two-year period, when the AYP will be measured. Every three years thereafter, the threshold of the academic achievement level must be raised until the year 2014, when the NCLB legislation required all schools and school districts in the country to reach a 100% proficiency level for all students on state assessment tests in the core academic areas of reading/language arts and mathematics (U.S. Department of Education, 2001).

Since 2001, NCLB has resulted in new regulations that include economic impacts for state funding and the ability for individual states to apply for waivers (U.S. Department of Education, 2013). An examination of school calendars as an independent variable that could have an effect on test scores may help to inform decision making in regard to assisting students and schools in meeting AYP. Several studies have demonstrated how learning theory, specifically the spacing effect phenomenon which serves as the theoretical framework that drove this study, has had a positive effect on the academic achievement of low socioeconomic status (SES) students when implemented through the use of a year-round academic calendar (Downey, von Hippel, & Hughes, 2008; Fairchild, 2011; Graves, 2011; Hammer, Lawrence, & Miccio, 2008).

The spacing effect phenomenon emerged in 1885 when Hermann Ebbinghaus, a German psychologist, was studying the concept of memory. He noticed that the timing and frequency of content delivery played a role in one's ability to retain and recall information. Specifically, if smaller units of information were presented, delivered, or distributed in a repeated fashion spread more evenly over a period of time, then retention and recall are improved, as opposed to the same information being delivered in a massed format over a shorter period of time. The collective results of most studies on this topic focus on benefits to low SES students. Rarely have such results mentioned any conclusive effect on the student achievement of those students who failed to meet the federally established eligibility criteria for the free and reduced lunch program, students who represent one-third of the United States student population (U.S. Department of Agriculture [USDA], 2011; U.S. Department of Education and National Center for Education Statistics, 2011). Additionally, several studies such as Evans (2007) and two seminal studies on this topic, Frazier and Morrison (1998) and Worthen and Zsiray (1993), focused on elementary students. This lack of study or failure to specifically examine the high school and that portion of the student population who fail to meet the federally established eligibility criteria for the free and reduced lunch program, creates a clear gap in the literature which was the subject of this study and provides an opportunity for expansion of the research on this topic. No calendar comparison studies to date have focused strictly on students who did not meet the federal eligibility criteria for the free and reduced lunch program and were high school seniors who had amassed four years of experience with a specific calendar type. Much of the academic calendar research has been focused on lower SES students at the elementary level and has produced findings that a year-round calendar does provide some benefit to this category of student. A look at the opposite end of the spectrum may provide some insight as to the impact of

calendar type on academic achievement for high school students who did not meet the federal eligibility criteria for the free and reduced lunch program. Such a study will help provide a more complete examination of calendar impact on academic achievement. The dependent variable of resulting SOL test scores will be presented in four core subject categories: English, math, science, and history and social science.

Problem Statement

Researchers have identified a loss of learned knowledge and diminished retention and recall of instructional material in students who experience an extended summer vacation period as part of a traditional school calendar (Cooper, Nye, Charlton, Lindsay & Greathouse, 1996). Literature related to summer learning loss indicates that students of low SES are more likely to be impacted by time away from school than their economically advantaged peers as revealed in a study conducted by Robert Joseph Evans (2007) of third grade students in Indiana schools who were administered state standardized tests between the years 2002-2005. In his analysis of standardized math test scores, Evans (2007) found that third grade students on free/reduced lunch and minority students in year-round education (YRE) programs performed better than students in the same categories who were enrolled in traditional calendar programs.

The YRE programs mentioned here are defined by the National Association for Year-Round Education (NAYRE, 2009) as programs that center on reorganizing the school year to provide more continuous learning by breaking up the long summer vacation into shorter, more frequent vacations throughout the year. It does not eliminate the summer vacation but reduces it and redistributes it as vacation or intersession time during the school year. Students attending a year-round school go to the same classes and receive the same instruction as students on a traditional calendar. The year-round calendar is organized into instructional periods and

vacation weeks that are more evenly balanced across twelve months than the traditional school calendar. The balanced calendar minimizes the learning loss that occurs during a typical summer vacation (Cooper et al., 1996). This summer loss of learning is sometimes alleviated with the implementation of summer enrichment programs (Green et al., 2011). However, the literature suggests mixed results in support of retaining the traditional calendar (Graves, 2011) or adopting a year-round calendar that reduces the extended summer vacation period and replaces it with shorter, more frequent and evenly disbursed vacation periods throughout the year (Gill, 2011). This is primarily due to the fact that some studies include mixed SES students among the sample population, depending on the student population of the school(s) studied, while findings almost exclusively reveal academic achievement benefit to the lower SES students, and mixed or unclear results for the students who failed to meet the federally established eligibility criteria for the free and reduced lunch program (Alcorn, 1992; Kneese, 1996; McMillen, 2001; Morton, 1989; Naylor, 1995; Winkelmann, 2010). Such studies never revealed any difference of statistical significance in student achievement for those students who failed to meet the federally established eligibility criteria for the free and reduced lunch program but simply included them (if present) as part of the existing population studied.

Conversely, two recent studies in California reported negative effects on student achievement (Graves, 2009; Mitchell & Mitchell, 2005). The Graves' study (2009) utilized longitudinal data for the state of California and focused on a particular multi-track (MT) year-round education (YRE) calendar that was implemented for the primary purpose of alleviating an overcrowding situation and providing some cost saving measures. Graves found that such advantages came at a cost in terms of the quality of education produced, as measured by a school's national percentile rank on standardized tests. The difference of implementing a year-

round calendar that Graves found was a change of one to two percentile points relative to a traditional calendar on national rank on reading, math and language scores.

This study looked at this problem from a different perspective than previous research by specifically focusing on the SES students who failed to meet the federally established eligibility criteria for the free and reduced lunch program in the twelfth grade population. The nature of the population in the particular schools examined (upper/middle-class Washington DC suburbs) lend themselves to this examination. Additionally, studies can be found that look solely at a particular academic skill such as reading or math; this study includes data gathered in the four core content areas of history and social science, math, English, and science. Other efforts were undertaken in attempts to remediate students who had failed to earn the grades or test scores necessary to pass to the next grade or to graduate. Statistics indicate that an increase in the number of summer school programs implemented in the United States over the last 25 years have virtually doubled (Borman, Rachuba, Hewes, Boulay & Kaplan, 2001); a recent search revealed this to be the latest available). Specifically, the problem is the existence of summer learning loss, and efforts to fully study possible methods of reducing such loss should be pursued.

Purpose Statement

The purpose of this non-experimental, ex post facto, causal-comparative study was to test the theory of German psychologist, Hermann Ebbinghaus, called the spacing effect (Dempster, 1988) as it related to a comparison of the traditional school calendar and a year-round school calendar. This was accomplished by investigating a possible impact of one or both of the categories of the independent variable (school calendar) on the dependent variable of SOL scores. Described methods of content delivery are depicted in Table 1 below. Additional variables of race, gender, SES, age and grade level were also examined as these variables had

been shown to moderate the interaction between the independent variable and the dependent variable (Alexander et al., 2007).

Table 1.1

Description of Content Delivery Method by Type of Academic Calendar

	Year-Round Calendar	Traditional Calendar
The Spacing Effect Theory	Spaced Content Delivery	Massed Content Delivery

Note. A description of “spaced” versus “massed” content delivery would be the presenting of a given curriculum to students where the content is divided into sections and delivered over equally disbursed segments of space and time (spaced), as opposed to having that same curriculum delivered over one period of space and time.

The independent variable was generally defined as the two existing, but different, calendars being implemented. One was the single track year-round calendar where students attended school over a 12-month period with a repetitive schedule; for example, 45 days of classes followed by a 15-day intersession. The other calendar was the traditional calendar where students attended school for nine months of the year followed by three months of summer vacation. Both calendars allowed for federally recognized holidays and slightly extended breaks at Christmas. The dependent variable was generally defined as standards of learning (SOL) test scores of the participating high school seniors. The understanding of differences between the implementation of these two calendars and any resulting significant difference in student achievement provided additional evidence for use by educators, along with other factors, in selecting the most appropriate and efficient calendar for their respective schools. This study examined differences in the academic achievement levels of high school seniors from varied distributions of scheduled vacation time throughout the high school experience. The independent variables compared were two different school calendars, while the dependent variable was the resulting test scores produced by the senior class students at each school. Accordingly, this study hoped to suggest or contribute to the understanding of one educational reform (i.e., vacation scheduling) which may impact the success of closing this learning gap.

Significance of the Study

The significance of this study lay primarily in its contribution to the knowledge base or discipline of education, both by testing the aforementioned theory and by demonstrating how it related to other studies that are similar or that have investigated the same issue. Other similar studies (Hess, 2006 and McMillen, 2001) have reported positive academic improvement for lower SES students as a result of having implemented a year-round calendar. However, this study examined such calendar implementation at all SES levels represented in the four-year senior class population to include those who met the federally established criteria for the free and reduced lunch program, and those who did not where mixed research results had emerged. The results of the study may help to inform decisions at the location (school districts) from which study data were drawn.

Researchers (Ballinger & Kneese, 2006 and Pedersen, 2015) have attempted to investigate a number of different school calendars and the impact those calendars might have on academic achievement. Four-day school week, block schedules, trimesters, extended time and camp or other workshop style programs have been tried. However, this study attempted to begin closing an empirical gap in the literature by focusing strictly on the difference between the traditional and year-round calendar.

The independent variable was the school calendars implemented; however, this variable was divided into two groups, one being the traditional school calendar with nine months of academic engagement followed by three months of summer vacation time implemented at one of the participating high schools, and the other being the year-round school calendar with a repeated sequence of eight weeks of academic engagement time followed by two weeks of vacation time. Both calendars used the same number of hours in an academic day and the same number of

academic days (180) per calendar year. The dependent variable was the pre-existing and resulting test scores of the senior class students at both high schools from their senior year Virginia end of year (EOY) SOL standardized test which reported four different scores for each student in the four core curricular areas of math, reading, science, and history and social science. This variable served as the dependent variable for research questions 1 and 2 and was examined according to race, gender, SES, age of student, etc. in addition to calendar just to cover all standard analyses (Gall, Gall & Borg, 2007).

Research Questions

RQ1: Is there a statistically significant difference between the Virginia standards of learning (SOL) test scores of twelfth grade students who were on a year-round school (YRS) calendar as compared to test scores of twelfth grade students who were on a traditional school calendar?

RQ2: Is there a statistically significant difference between specific core-content area test scores on the Virginia standards of learning (SOL) test of twelfth grade students who were on a year-round school (YRS) calendar as compared to test scores of twelfth grade students who were on a traditional school calendar?

Definitions

1. Adequate yearly progress (AYP) - AYP is a measurement of student academic performance that allows the U.S. Department of Education to determine how every public school and school district in the country (only those subject to Federal funding; AYP does not apply to private schools) is performing academically according to results on standardized tests (U.S. Department of Education, 2001; No Child Left Behind Act, 2001).

2. End of course (EOC) - EOC refers to an examination that is given to students once they have covered the material. The exam is designed to measure a student's curricular comprehension of the information presented during the course (Virginia Department of Education, 2011).
3. End of year (EOY) - EOY refers to a comprehensive criterion-based examination that is given to students once they have covered prescribed material. The exam is designed to measure a student's curricular comprehension of the information presented during core courses of a specified school year (Virginia Department of Education, 2013).
4. Ex post facto – Ex post facto refers to the obtained test scores that already pre-existed prior to the conduct of this study (Gall et al., 2007). School schedules utilized by the participating schools have existed and been in place for at least the previous four years. The researcher has done nothing to create or manipulate these school calendar schedules to serve as the intervention.
5. Institutional Review Board (IRB) - IRB is a committee that exists to protect the rights and welfare of human participants in research studies.
6. Lower socioeconomic status (SES) – Lower SES students are those students who do qualify for the federal free and reduced lunch program (USDA, 2011).
7. No Child Left Behind (NCLB) – NCLB refers to the reauthorization of the Elementary and Secondary Education Act of 1965, when a piece of federal legislation signed into law in 2002, known as the “No Child Left Behind Act of 2001” required stronger accountability and measurement of AYP in all state federally-funded schools and school districts (U.S. Department of Education, 2001).

8. Standards of Learning (SOL) – SOLs describe the Commonwealth of Virginia’s expectations for student learning and achievement in grades K-12 in English, mathematics, science, history/social science, technology, the fine arts, foreign language, health and physical education, and driver education (Virginia Department of Education, 2013).
9. Summer slide/loss/effect/gap/learning gap – This gap refers to a student’s cognitive regression or loss of learning that occurs over the extended summer vacation period.
10. Non-lower socioeconomic status (SES) – Non-lower SES students are those students who do not qualify for the federal free and reduced lunch program (USDA, 2011).
11. Year-round education and Year-round schooling (YRE and YRS) – YRE and YRS refer to 180 days of academic engagement during a calendar year that follows a prescribed evenly distributed pattern of academic engagement followed by vacation periods (usually a repeated pattern of eight weeks of academic engagement followed by two weeks of vacation time). This term refers to single track (as opposed to multi-track) year round calendars.

CHAPTER TWO: LITERATURE REVIEW

Overview

This chapter will provide an explanation of the theoretical framework upon which this study was based. The theories and phenomenon will be linked to the purpose of the study and will describe the origin and evolution of the theoretical concepts. Additionally, a comprehensive review and synthesis of the existing literature that pertained to the topic of the study will be included. This information will be linked to the purpose of the study and will provide a basis for a supporting argument for the study's significance. A discussion as to what has been examined, what has not been examined, and how understanding on the topic is still developing will be provided. An explanation as to how an identified empirical gap in the literature can be partially filled by this study will be mentioned, thereby furthering understanding in the field of education.

Prior studies have shown evidence of advantages and disadvantages with no conclusive results as to the benefits of one calendar over another (Graves, 2011; McMullen & Rouse, 2012b; Wu & Stone, 2010). This study sought to extend the body of evidence in the exploration of both calendar options. The indecision among educators and other stakeholders in the education process represents an empirical gap in the literature that warrants further study to help better understand and determine the benefits of one calendar over the other. Several studies, such as Evans (2007) and two seminal studies on this topic, Frazier and Morrison (1998) and Worthen and Zsiray (1993), focus on elementary students. The gap can be further defined by looking at any difference in student achievement among students of a SES other than lower (particularly twelfth graders) who have experienced the year-round calendar for four years as opposed to those who have experienced the traditional calendar for that period of time. This gap in the literature, a lack of study into any difference in student achievement among students of a

SES other than lower, particularly twelfth graders, who have been exposed to a particular but different calendar experience for all four of their high school years, has been corroborated and concurred with as a worthy topic for its results will contribute to and extend the body of knowledge on calendar comparison (C. Ballinger personal communication, February 14, 2014). Dr. Ballinger has been involved with school calendar modification for over three decades, authored books and articles on the topic, served as executive director of the National Association for Year-Round Education, coordinated and directed year-round education and school calendar modification efforts in a variety of ways to curb the significant learning loss experienced by many students during the extensive summer vacation allowed by numerous North American school districts. Mixed research results have emerged when it comes to examining student achievement among non-high needs schools when year-round and traditional school academic calendars have been implemented (Haser & Nasser, 2005). Much of the existing literature has found year-round schooling to be beneficial almost exclusively among lower SES students (Silva, 2007). Providing administrators and educators with a firmer foundation upon which they can make informed decisions about which calendar (year-round or traditional) to most appropriately implement at their location to maximize student achievement was a hopeful outcome of this study.

This or any study of year-round learning will inevitably include a discussion of what has come to be known as a summer learning loss. The learned knowledge that some students fail to retain over a long summer vacation is often the focus of year-round educational attempts to reduce such a loss.

Theoretical Framework

There is reason to believe that differences (timing and frequency) in the distribution of content delivery can have an effect on one's ability to recall and retain information (Dempster, 1988). The origin of this social cognitive theory known as The Spacing Effect, which refers to the finding that for a given amount of study time, spaced presentations yield substantially better learning than do massed presentations, is rooted in the early works of German psychologist, Hermann Ebbinghaus, who studied the concept of memory. The spacing effect has been known since 1885 when Ebbinghaus published the results of his seminal experimental work on memory. Ebbinghaus found that for a single 12 syllable series, 68 immediately successive repetitions had the effect of making possible an errorless recital after seven additional repetitions on the following day. However, the same effect was achieved by only 38 distributed repetitions spread over three days. On the basis of this and other related findings, Ebbinghaus (1885) concluded that "with any considerable number of repetitions a suitable distribution of them over a space of time is decidedly more advantageous than the massing of them at a single time." In Ebbinghaus' First Forgetting Curve and other chart depicted below (see Figure 2.1), one can see that the more time one spends away from content presented, the lower one's retention of learned material. Accordingly, it can be presumed that if curriculum content is delivered on more frequent and equally spaced intervals with shorter breaks or vacations, the student will most likely enjoy a higher retention rate of material presented.

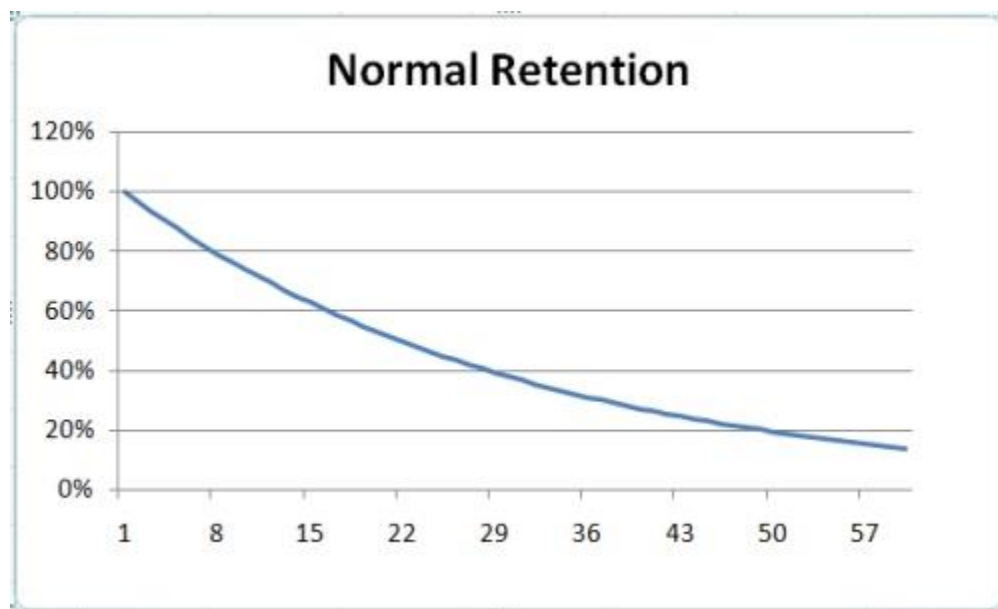
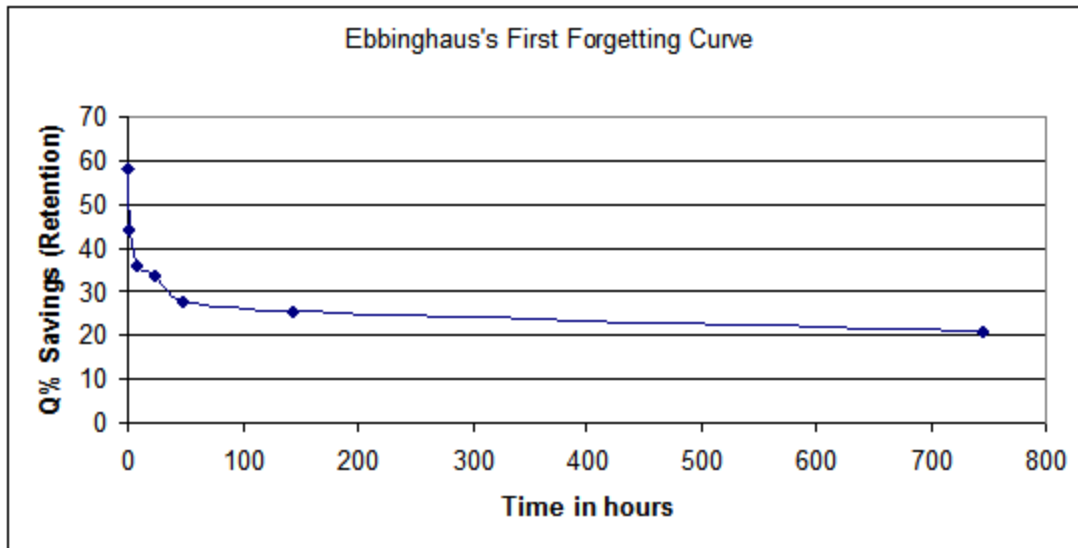


Figure 2.1. The charts above indicate rates of retention loss according to Hermann Ebbinghaus

Another theoretical frame, Maslow's social cognitive theory of motivation (Maslow, 1943) will also be examined and discussed with a focus on how it contributes to the significance of this study.

Good learning theories always specify the role of the educators, the role of the learners, and above all, the relationship between the educator and the learner. This line of thought

has become important simply because more and more people buy into the concept that it is in relationship with others that humans learn” (Wang, 2012, p. 9)

Related Literature

The literature reviewed will be categorized into the following five themes. First, the development and evolution of the traditional school calendar will be examined, followed by (second) highlighting some of the research that supports this calendar. Thirdly, a look at how the development of the year-round school calendar evolved, along with (fourth) a discussion of research that supports the use of all twelve months for educational purposes. And finally, some other attempts at using the summer months to improve student achievement will be mentioned. These themes represent the focus of the majority of the topical research published to date.

Development and Evolution of the Traditional School Calendar

According to a 2005 report by the National Education Commission on Time and Learning entitled *Prisoners of Time*, many public school personnel are, and have historically been, captives of the school calendar and clock. Teachers have the ability to teach and students the ability to learn all year long. In the interest of improving student achievement, perhaps a six-hour school day for 180 days followed by a three month vacation should be a thing of the past. Despite this year-round ability, public education in the United States has continued to subscribe to a school calendar that was originally designed to accommodate the functioning of an agrarian society. As late as 2003, most U.S. public schools clung to this tradition and resisted change to the calendar which, since the late 1800s and early 1900s, catered to the notion of allowing children and teenagers to fulfill their important workforce role on many family farms (Glines & Bingle, 2002). For the past 150 years the concept could be described as, learn what you can in the time we make available.

In the 1860s, prior to the Civil War, urban students attended school for a minimum of 240 days per year while their rural counterparts attended for six months per year (three in the winter and three in the summer) which left time for the children to assist with their family's seasonal agricultural duties. In 1852, Massachusetts started what was to become a trend toward a common calendar by enacting a compulsory attendance law compelling children ages eight through 14 to attend school for 12 weeks each year. Other states followed this example throughout the 20th century. With increased industrialization spreading throughout the country and the passage of federal child labor laws, a common school calendar became important to the states. This importance may have been rooted in the rising demand for an educated work force and in sparing children from hot classrooms in the summer months. Although these two concepts may not appear compatible, they do represent two distinct reasons for the establishment of the traditional school calendar. Establishing a minimum number of school days was critical to decrease education costs and taxpayer subsidies. The common calendar that emerged from these and other necessities was the current nine-month school calendar with a three-month summer vacation (Dixon, 2010).

Even though an overwhelming majority of literature on this topic subscribes to the notion that the establishment of the traditional school calendar (nine months in school, followed by a three-month summer vacation period) has its roots in the American agrarian society, there is, however, at least one author with a different point of view. Kenneth Mark Gold, in his 2002 book, *School's In: The History of Summer Education in American Public Schools*, about summer education in American public schools clearly argued against this notion, stating that summer vacation marked a conscious recognition of the value of rest and was not a vestige of the farm labor cycle.

Although there are arguments for the traditional calendar, most of the reasons are not anchored in concepts that focus on improving student achievement. One example is the fact that entire industries are dependent on the available labor pool of American youth during the summer months. Economic profits for retailers and those in the entertainment and hospitality industries are tied to large numbers of American families traveling and vacationing during the summer. Some states have even gone as far as to create legislation to protect some of these vacation and entertainment industries. Minnesota, Michigan, and Virginia have all passed and enacted legislation that prohibits public schools (unless granted a waiver) from starting a new school year prior to the federal Labor Day holiday. Virginia's version of this regulation is often referred to as the "King's Dominion" law, making reference to the largest amusement/theme park in the state, which relies heavily on many of its summer part-time employment positions being filled by out-of-school high school students to help operate the park as it caters to the large number of vacationing families who are also out of school for the summer. This seasonal part-time summer employment period is viewed by some parents as a positive opportunity for their high school children to seek, find, and hold jobs and are concerned that changing to a year-round schedule would disrupt this employment opportunity (Ballinger & Kneese, 2006). Other concerns expressed when considering a move from a traditional calendar include whether or not childcare would be available when students were on their shorter and more dispersed vacation or intersession periods. Also, many families have multiple children of varying school ages which could easily place different members of the same family on different school schedules causing disruption in the planning and execution of family activities.

Research that Supports the Traditional School Calendar

Much of the literature that is meant to support the continued use of the traditional calendar tends to focus on the disadvantages of implementing a year-round program of instruction. “The existing school calendar has worked in the past and can continue to work in the future” (Carter, 1999, p. 4).

It is my contention that the decision to change the school calendar is not usually based on the belief that it will solve the problems our schools face but rather on financial considerations. Making such a drastic and unfounded change in the way our schools operate appears to be more of an attempt by politicians and school officials to give the appearance of doing *something* to save education. (Carter, 1999, p. 1)

Economics are often the target when defending the continued implementation of the traditional school calendar. In this time of fiscal restraint and limited shrinking budgets, school administrators are constantly seeking ways to reduce spending. The line that they must be weary of crossing and the question that must be at the forefront of their decision making is whether or not such a cost saving decision will have a negative impact on student achievement. Moving from a traditional school calendar to a year-round program of instruction (either single or multi-track), with the extended use of the physical facility, can often incur additional costs. These costs can surface in areas such as maintenance, utilities, extra staff, operating costs, teacher salaries, building upgrades, additional transportation requirements, and costs associated with solving the disruption that can occur with the music and athletic programs in attempts to field complete and cohesive teams and musical ensembles.

Other reasons cited to maintain a traditional calendar include increased administrator burnout, scheduling conflicts for family vacations and community activities when siblings are on

different schedules, difficulty in making daycare arrangements, and teachers finding it more difficult to arrange in-service days and having to endure the inconvenience of changing classrooms (Worthen & Zsiray, 1994). Additional perceived barriers to implementing year-round education schedules included concern over arranging convenient times for the conduct of singular events such as prom, student council meetings, and special subject singleton courses. Teachers who wanted a career that offered a three-month vacation, the absence of abundant research to “prove” (Glines, 2002, p. 27) that students achieve more in year-round schools, the disruption of traditional summer activities, such as Little Leagues and vacation Bible schools, are all issues raised by individuals seeking to maintain traditional school calendars. The overarching weakness in these claims is their absence of a foundation based on student achievement rather than personal convenience and maintaining the status quo or tradition. Even community members outside of the direct educational employ, such as camp owners, tourist resort operators, and amusement park personnel, raise personal and traditional concerns as they count on less expensive labor costs by having an abundance of students and teachers seeking employment in the summer (Glines, 2002).

Development and Evolution of the Year-Round School Calendar

The idea of utilizing all 12 months of the year for schooling purposes is nothing new. Historically, YRE records of the early 1900s describe programs in a variety of communities, including Newark, New Jersey (1912); Minot, North Dakota (1917); Omaha, Nebraska (1924); Nashville, Tennessee (1925); and Aliquippa (1928) and Ambridge (1931), Pennsylvania. They were implemented for a variety of reasons: Newark to help immigrants learn English and enable students to accelerate; Bluffton to improve learning and create additional classrooms; Minot to meet the needs of the laggards (students who fall behind); Aliquippa and Ambridge for space;

Omaha to offer continuous vocational training programs; and Nashville to improve the quality of education. Glines (2002) indicated that these are all valid pieces of the calendar puzzle.

The roots of year-round teaching and learning could theoretically be traced by scholars to the beginning of life, as one could question if cave people had a summer vacation for their young as they helped them learn the process of survival. As time fast-forwards to the 19th century searching for what could be claimed as the beginning of year-round education, some scholars overlook the fact that eastern urban schools in the 1840s were open 12 months a year. Many calendars in New York, Philadelphia, Boston, Buffalo, Cleveland, and others with large numbers of non-English speaking immigrants, consisted of 240-250 days. Although learning was available year-round, few children attended that many days and most completed only an elementary level education. In rural areas during this period of time, many farm communities had no schools or ones that were open only limited months each year. Brief attendance was the norm due to a lack of school busses, winter storms, travel distances, and the necessity of planting and harvesting.

Several societal implications led to the development and consolidation of more schools and compulsory attendance. Child labor laws, the rise of unions, the increase of industry in the cities, the limited number of youth attending high school, the lack of transportation, the still agricultural status of the nation, and the emerging of multiple languages with the arrival of new immigrants, all contributed to the eventual emergence of more uniform schools and calendars. Another distinction between the cities and rural communities was the 1847 implementation of the graded school structure which grew rapidly in the urban areas while the non-graded, one-room, country schoolhouses still dominated the rural areas. However, a trend toward more uniform calendars emerged as cities decreased and rural areas increased the number of school

days. This spawned the concept of summer school, as hot summer days in the city caused urban schools to lessen school days in the summer so the youth could play outdoors. Often, however, both parents in immigrant families were working and this situation gave rise to a need for babysitters which was a circumstance that went unaddressed by the school systems. In the 1870s it was this need that led to the development of vacation schools. Fortunately, private agencies came to the rescue. Social service centers, churches, YMCAs, private enterprises, and community cooperatives offered summer programs that provided child supervision and formal learning experiences as well (Glines & Mussatti, 2000).

Credit for devising the concept of year-round education (YRE) in the United States is most often rooted in Bluffton, Indiana, with the first year-round school operating as early as 1904. Some relate the beginning of YRE to summer vacation schools in 1870, while others cite that urban schools in the United States in 1840 operated for 240-250 days per year. Though few students were in attendance for that total, schools were open year-round. On the contrary, rural schools often functioned for only two to six months as the result of weather, transportation, farm, and fiscal priorities (Glines, 1994).

At this point, a brief definition of the concept of year-round schooling is warranted, due to the fact that such a schedule is offered in a variety of formats which can add to the confusion when studying the topic. As described by Education Encyclopedia (2014), YRE is a concept designed to minimize three-month summer learning losses and maximize the use of public facilities by dividing the school attendance days into rotating instruction and vacation periods. Students are enrolled in formal learning programs over a 12-month year, keeping school buildings open at least 240 days.

Subsequent to explaining how the YRE movement was established in the United States, another definition of year-round education will be offered by the one organization in the United States that has existed solely for the purpose of advocating year-round calendar options with a goal of reducing summer learning loss and increasing student achievement. From 1902 to 1972, scattered individual school districts unsuccessfully dominated efforts to generate a nationwide forum to rethink the rationale for closing schools each summer. A unified group, rather than an individualized focus, was necessary and important if all fifty states were going to be asked to reflect upon their policies related to cycles of learning. Accordingly, random sponsorship by lay persons, educators, and interested education agencies produced the first three national seminars that dealt with YRE in 1969, 1970, and 1971. These gatherings revealed the fact that continuity and cohesion were essential to an effective dissemination of information regarding YRE. At the third seminar, plans were formulated to establish a national entity to serve as a clearinghouse on YRE topics and to provide a conduit for subsequent annual meetings. This meeting also resulted in the election of an ad hoc planning committee. The fourth annual meeting was held in San Diego and a proposed set of by-laws for a national organization were recommended. Those in attendance approved the recommended by-laws, and The National Council on Year-Round Education (NCYRE) became a reality in 1972.

Based on their interest and recognized individual and extensive work with year-round education, Wayne White, George Jensen, James Bingle, Don Glines, Oz Johnson, Evelyn Carlson and Stuart Beville were voted in as the first board members. John McLain of Clarion State College in Pennsylvania was appointed Secretary/Treasurer. Doctor Wayne Worner, who had recently moved from his role as superintendent in Grand Forks, North Dakota (where he had proposed a year-round program for that community) to a staff position at Virginia Polytechnic

Institute and State University (V.P.I.) in Blacksburg, Virginia, was selected as Administrative Coordinator for the NCYRE and was able to have V.P.I. provide physical office space for the Council headquarters. With the help of the school of education at V.P.I., the council was able to establish its first communication vehicle, a newsletter titled the *Year-Rounder*.

With the exception of 1978, national annual conferences were held from 1969 to 2003 in locations such as Arkansas, Pennsylvania, Florida, California, Virginia, Illinois, Colorado, Washington, D.C., Nevada, and Texas. Struggling financially, the Council continued to promote, advocate, teach, train, and maintain statistical data on what was the growing number of schools, school districts, states and foreign countries participating in and offering year-round learning experiences for its youth. In 1986 many discussions within the Council led to the conclusion that changing the organization from a “Council on” to an “Association for” would provide better opportunities to accomplish the goals of the Board. Accordingly, in October of 1986 the Board voted to dissolve the National Council on Year-Round Education (NCYRE), and replace it with the National Association for Year-Round Education (NAYRE), which would enable the organization to provide a renewed focus while maintaining much of the Council’s structure, by-laws, fiscal assets, seminar sponsorship, and dissemination activities (Glines & Bingle, 2002). The NAYRE (2009) sets forth the following definition for year-round education:

Year-round education centers on reorganizing the school year to provide more continuous learning by breaking up the long summer vacation into shorter, more frequent vacations throughout the year. It does not eliminate the summer vacation, but reduces it and redistributes it as vacation or intersession time during the school year. Students attending a year-round school go to the same classes and receive the same instruction as students on a traditional calendar. The year-round calendar is organized into instructional periods

and vacation weeks that are more evenly balanced across 12 months than the traditional school calendar. The balanced calendar minimizes the learning loss that occurs during a typical three-month summer vacation.

The schedule format can be offered in a variety of ways commonly designated by the number of in-school days followed by the number of days that immediately trail such an in-school period that represents the number of vacation or intersession days. There are over 30 different mechanical methods of rearranging the calendar toward continuous learning concepts. Examples of these distinctions would be a staggered, block or flexible (45/15); a staggered, block or flexible (60/15), (60/20) and even a (90/30) day plan. Staggered or block 30/10; 25/5; Concept 6; Modified Concept 6; 30/10; 25/15; Concept 8; Concepts 12 and 16; Multiple Access; Quarter Plan; Quinmester; 60/15; Orchard Plan; Extended School Year; Modified Summer Term; Flexible All-Year; Personalized Continuous Year; and many special community variations (Glines, 1994). According to Dr. Don Glines, the Director of Educational Futures Project based in Sacramento, CA, these calendar rearrangements can either work or fail.

One of the most noted calendar options was created by William Wirt, the superintendent who began the first YRE program in Bluffton. Moving to Gary, IN, he instituted the work-study-play school and the famous platoon system. At its height, this extended year, extended day, curriculum oriented, space saving plan, in conjunction with the work-study-play concept, was adopted by 240 communities. In Gary, 1907-1937, almost continuously, the program was available 50 weeks a year, 12 hours a day, 6 days a week. This prototype has been documented in a 1937 book by William Wirt (1937). The foregoing information was obtained and utilized with written permission from an undated background paper discussing a 100-year history of YRE by Dr. Don Glines (personal communication, January 21, 2014).

The pre-1940 prevailing continuous learning philosophies were led by Wirt, along with Henri Weber in Nashville, Harlan Vanderslice in Aliquippa, John Beveridge in Omaha, Bennett Jackson in Minneapolis, and Addison Poland and Warren Roe in Newark. They paved the way for the current year-round programs. For various reasons, many of the early program adoptions did not survive the late 1930 depression years and the national uniformity needed during World War II. Many attempts to renew these plans emerged between 1946 and 1966; however, the concepts were not reactivated until 1968-1970 in communities in Missouri, Illinois, California, and Minnesota. Initially, the resurgence years, 1970-1990, represented primarily mechanical calendar changes to generate space, though the education and community benefits became better understood as the calendar variations spread across the nation. The total value of YRE came into focus during the late 1990s.

The 45/15 single track day plan is the most common and will be the one compared to the traditional calendar in this study. This schedule (45/15) consists of four nine-week terms with each being followed by a three-week break. Teachers and students alike adhere to this schedule, repeating this pattern throughout the school year, and concluding with a five-week break in the summer. School year breaks are divided into two parts. The term break refers to a period of time in the schedule that can be used for vacation or it may be utilized in total or in part in a more academic manner. When used for a more academic purpose, breaks are often referred to as academies or intersessions. Often the longer part of the break period is used for academic instruction. Schools/school districts have the ability to develop their own curriculums when establishing academies or intersessions and they are generally designed to address remediation, enrichment, and acceleration (NAYRE, 2009).

Next, there is a multi-track version of the 45/15 model where the students are divided into four groups. Three of the groups are in attendance while simultaneously the fourth group is on break. Every three weeks the groups rotate. Each group adheres to its own 45/15 schedule. This model can offer and is often implemented for the express purpose of increasing building utilization (by as much as 33%) and curtailing some overcrowding concerns. Under this scenario, some teachers may request additional assignments to continue teaching during their break period to increase their annual compensation (Glines, 1994).

Additionally the 60/15 and 60/20 schedules both offer single track and multi-track options with most breaks being scheduled during the typical holidays and a longer summer break is being available with the 60/15 option. Finally, the 90/30 schedule (also single or multi-track) includes breaks during the regular winter and spring vacation periods. A five-track format is also available consisting of five terms of 45 days each where students attend four of the five terms to accumulate their required 180 days of school. This format allows for a three-week summer break (Ballinger & Kneese, 2006; NAYRE, 2009). “Suffice it to say here that there are many calendar plans that rearrange instructional time. School time is flexible enough that student learning can be enhanced and parental and community needs can be met” (Ballinger & Kneese, 2006, p. 59).

Before any community, political and educational leaders make a decision as to which, if any, type of year-round or alternative school calendar to adopt, planners should carefully consider the advantages and disadvantages of each calendar type, and the best match for their particular environment. Year-round calendars have been successful in mountain, desert, valley, and seashore topographies; in urban, suburban, and rural settings; in high, middle, and low income neighborhoods; and with all ethnic, racial, and religious diversities. Acceptance and

understanding are the key elements for successful YRE calendar implementation, not the particular mechanical parts of a given enrollment plan (Glines, 1994). Regarding the number of U.S. schools utilizing a year-round school calendar, the most recent data available from the National Center for Educational Statistics with the U.S. Department of Education are provided in the Table 2.1 prepared in February 2014.

lunches								
Less than 35	27,000	(620)	600	(100)	2.2	(0.39)	187	(5.5)
35 to 49	14,600	(540)	300	(100)	2.2	(0.67)	181	(1.4)
50 to 74	23,000	(540)	600	(100)	2.7	(0.49)	180	(.6)
75 or more	22,100	(620)	1,600	(200)	7.2	(0.91)	188	(1.9)
School did not participate in free or reduced-price lunch program ...	3,300	(270)	500	(100)	15.7	(2.85)	214	(14.7)

/1/ Year-round cycle is defined as a cycle of school days distributed across 12 months of the calendar year and all students attending on the same cycle.

Note. Detail may not sum to totals because of rounding.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Schools and Staffing Survey (SASS), "Public School Data File," 2011–12. (This table was prepared February 2014.) {A phone con w/DoE rep "Oscar" at 1-800-872-5327 at 12:53 on Aug 14, 2014 granted and confirmed permission to use this data citing that all information available on the U.S. DoE website is considered public domain}.

Research That Supports the Year-Round School Calendar

The idea of taking advantage of a student's ability to learn throughout all 12 months of a given year is not a new one, nor is it a concept that has escaped attention from the highest authoritative levels in the United States. Perhaps it was his upbringing, his background, or the fact that he graduated from Southwest Texas State Teachers College and was a teacher himself, but when President Lyndon Baines Johnson addressed ten thousand members of the American Association of School Administrators at their annual convention on February 16, 1966, at an Atlantic City, New Jersey venue, he presented some of his dream for the future of education as he recognized, even then, a need to change from schooling to learning. Often considered the most forward-looking occupant of the White House, the speech he delivered included the following:

Tomorrow's school will be a school without walls, a school built of doors which open to the entire community. Tomorrow's school will reach out to the places that enrich the human spirit, to the museums, the theaters, the art galleries, to the parks and rivers and

mountains. It will ally itself to the city, its busy streets and factories, its assembly lines and laboratories, so that the world of work does not seem an alien place for the student. Tomorrow's school will be the center of community life, for grownups as well as children, a shopping center of human services. It might have a community health clinic or a public library, a theater, and recreation facilities. It will provide formal education for all citizens, and it will not close its doors anymore at three o'clock. It will employ its buildings "round the clock and its teachers 'round the year'" (Glines, 2012).

According to Dr. Charles Ballinger (Executive Director Emeritus of the NAYRE) and Dr. Carolyn C. Kneese (professor at Texas A&M University), reducing the length of the summer vacation associated with the traditional school academic calendar, and spreading the in-school days (interspersed with shorter break periods) over a 12-month period is beneficial to student achievement. Introducing curricular content in a more equally spaced (spacing effect) and evenly distributed manner, can make better use of the same 180 in-school days (that a traditional calendar employs) to bring about a reduction in the summer learning loss. In their book, *School Calendar Reform: Learning in All Seasons*, Ballinger and Kneese (2006) expounded upon several reasons for changing the school calendar from a traditional one to a year-round educational opportunity. In addition to reducing the negative impact of summer loss, six other reasons related to student achievement are mentioned. These include the claim that "modified, balanced calendars can effectively maintain student interest in learning" (Ballinger & Kneese, 2006, p. 6-8). This interest can be linked to Maslow's theory of human motivation (Maslow, 1943). Here Ballinger and Kneese asserted that a balanced year-round calendar provides a logical pacing (spacing effect) of instruction, followed by regular breaks. "Students learn differently and thus require different time configurations" is another assertion, noting that while

many educators acknowledge differences in student learning styles, they often at the same time subscribe to the thesis that all students learn in the same way, at the same time, and that one calendar fits all (Ballinger & Kneese, 2006, p. 6-8). “Intersession classes provide faster remediation and advanced enrichment” (p. 6-8). When a student is struggling with an academic concept, intersession becomes a valuable opportunity to take immediate corrective action and allows students to return to class when instruction begins anew at a more comparable level to that of their classmates. “Students learning a second language can benefit from a balanced calendar” (Ballinger & Kneese, 2006, p. 6-8). Language acquisition for students learning English as a second language or other bilingual learners becomes more difficult when spending extended periods of time away from the interaction and study of the language (Ballinger & Kneese, 2006; Hammer et al., 2008). “Co-curricular and extracurricular activities can take place throughout the year to reinforce previous learning” (Ballinger & Kneese, 2006, p. 6-8).

Ballinger and Kneese (2006) mentioned that research indicates students remember recent learning best when they have an opportunity to apply what they have learned. The closer in time these application opportunities are to when the learning takes place, the more lasting and effective they will be. Examples given for science learning could be using an intersession period to work on a related science project, independent science study, or attend a science camp, all of which can build upon and add to a student’s recent science learning experience. Finally, mention is made of “teachers’ ability to take advantage of year-long opportunities for staff development” (p. 6-8). Often content area national or regional conferences are offered in the middle of the traditional school year limiting a teacher’s ability to attend. A year-round schedule offers more opportunities to attend professional conferences and to conduct in-service training sessions (Ballinger & Kneese, 2006). Bradley J. McMillen conducted a literature review in 2001

evaluating academic achievement in the year-round schools of North Carolina. The review examined the results of several published articles and studies on the topic of year-round versus traditional school calendars. Included was an examination of some 15 studies that were the basis of a review conducted by Kneese in 1996 that specifically focused on achievement in traditional calendar and year-round schools. The findings in this review and in the review of other studies (Gandara & Fish, 1994) echoed that achievement in year-round schools appeared to be at least equal to or slightly higher in year-round schools being particularly beneficial for lower achieving students (McMillen, 2001).

Traditional and Year-Round Calendar Comparative Study Results

In their 2009 book, *Balancing the School Calendar: Perspectives from the Public and Stakeholders*, Kneese and Ballinger reported the results of several studies that investigated the comparison of traditional versus year-round school calendar implementation. The majority of studies conducted on this topic took a specific approach that either focused on the elementary level, students in the lower socioeconomic status (eligible to participate in the federal free and reduced lunch program), or involved a large number of population/participants such as comparing several schools and or districts across the country or a particular state. An example of the results of such a study are depicted in Table 2.2 where nine traditional school districts were matched on 12 different and specific performance indicators and compared to nine year-round school districts.

Table 2.2

Matched School Districts Results for Performance Indicators at the 0.05 Significance Level

Matched School Districts	Performance Indicators											
	A	B	C	D	E	F	G	H	I	J	K	L
1	N	N	Y			N	Y	Y	N	Y	N	Y
41	N	N		T	T	N			N		N	
2	Y		Y	Y	Y	Y	Y	Y	N	Y	Y	Y
42		T							N			
3	N	N	Y	Y	Y	Y	Y	N	N	Y	N	N
43	N	N						N	N		N	N
4	N	N	Y	N		Y	Y	Y	N	Y	N	N
44	N	N	N	T					N		N	N
5	N	N	Y	Y	Y	Y	Y	Y	N	Y	N	N
45	N	N							N		N	N
6	N	N			N		Y	Y	N	Y	N	N
46	N	N	T	T	N	T			N			N
7	N	Y	N	Y			N	N	N	N	Y	
47	N		N		T	T	N	N	N	N		T
8	N	N	Y	Y	Y	Y	Y	Y	N	Y	N	N
48	N	N							N		N	N
9		N				Y	Y	Y	N	Y	N	N
49	T	N	T	T	T				N			N

Legend

- A Student Absence
- B Student Dropout
- C California Test of Basic Skills (CTBS) Mathematics Assessment
- D CTBS Reading Assessment
- E Accountability Testing System (ATS) Mathematics Assessment

F	ATS Reading Assessment
G	Student Attitude Toward Mathematics
H	Student Attitude Toward Reading
I	Eleventh Grade Student Self-Esteem
J	Teacher Attitude-Student Education Benefits
K	Teacher Attitude-Teacher Welfare Benefits
L	Teacher Stress

Key

Y	Year-round education school district superior
T	Traditional calendar school district superior
N	Difference between year-round and traditional school districts not significant at the 0.005 significance level

Note. Obtained from Kneese & Ballinger (2009), pp. 109-114

Alternative Strategies Utilizing Summertime to Improve Student Achievement

The four-day school week (Hewitt & Denny, 2011), block schedules, attempts to extend the amount of time in a school day, the number of days in a school year, trimesters (Bair & Bair, 2010), quarters, quinesters, octamester, year-round education without walls plan, variable term plan, experimental city plan, orchard plan, modified calendar plan, mountain calendar plan, and additional single track calendar format arrangements such as a 45/10, 45/15, 60/20, 90/30, 60/15, 25/10, 25/5, 30/10, 30/5, concept 16 plan, concept 12 plan, multiple access plan, community YRE plan, five stream plan, concept nine plan, and the personalized continuous year plan, have all, according to Glines' 1994 *NAYRE* publication that discusses plans for year-round calendars and enrollment, been formulated and proposed by calendar theorists and practitioners. In the Concept 6 plan, the school year is divided into six terms of approximately 43 days. Students and teachers attend two consecutive sessions and then have one session off for a total of 172 instructional days. Glines has further suggested that there is potential for some 14,000 different calendars, one designed for each school district (Ballinger & Kneese, 2006, p. 59).

Clearly, professional educators are seeking solutions to make the most effective use of learning time in an effort to improve student achievement. Timing and planning its most efficient use is critical when it comes to improving student achievement. Ballinger and Kneese (2006) broke it down as follows: 365 days per calendar year, 180 days of legislatively mandated instruction annually, 104 weekend days (Saturday and Sunday), 10 winter holidays (Christmas, New Year's), and 11 other legal holidays, which leave 60 remaining optional/flexible days. The National Education Commission on Time and Learning (NECTL) report entitled *Prisoners of Time*, originally a 1994 document, reprinted in October 2005, indicates that students in the United States spend 1,460 hours engaged in required core academic instruction during the final four years of secondary education. This is compared to 3,170 hours for Japan, 3,260 hours for France, and 3,528 hours for Germany (NECTL, 2005, p. 24). On a comparative basis (in terms of days), the 180 mandatory days of school attendance per year in the United States falls short of the 190 required days in the United Kingdom and the 208 days attended in East Asia (Ballinger & Kneese, 2009). Adding the additional instructional time can produce a positive impact on student achievement; however, this study seeks to examine what might possibly be a more effective and efficient use of the 180 days currently legislatively mandated within the United States public education system.

Ballinger and Kneese (2006) purported that over time the school year will be transformed into one designed primarily for optimum student learning. They cited educational, social, economic, and political forces at play that increasingly encourage calendar modification. For each of these areas a brief discussion follows.

On the educational front, the push to alter the school calendar comes from both classroom teachers and educational researchers. Recognized for more than 50 years, teachers, each fall, are

reminded of the existence of the summer learning loss exhibited by their students through characteristics of forgetfulness, causing teachers to question what was retained of the content taught the previous year. Educational researchers for some 20 years have confirmed this concept of summer learning loss, which when combined with the concerns raised by the classroom practitioners, has raised the awareness of those interested in boosting the achievement level of American students. Both of these groups of professionals and others are subscribing to the thesis that reducing the length of the summer vacation is one likely way to reduce summer learning loss. As these groups remain aligned on this issue it produces a professional pressure which will likely manifest in a change to the American school calendar to fit more nearly the way students learn.

The social force at play stems from community entities such as youth-serving agencies, academia, and law enforcement asking the question: What societal value is served or enhanced by having hundreds of thousands of America's youth largely unoccupied, unemployed, or unsupervised for up to three months each year? An increasingly urban and technological America gives rise to the concern of whether or not America's youth are productively engaged during the summer months. Many homes have the single parent or both parents at work and absent for much of the time that students are out of school. These circumstances give little support or incentive for children to read, do summer homework assignments, discuss and think about the important issues of the day over the family dinner table, or engage in learning activities generated by parental interests, hobbies and everyday work. This lack of parental support and supervision over the summer months lacks any form of formal instruction and the aforementioned agencies say it is time to rethink summer vacation.

Economically many communities seek to find solutions to an increasing tax structure and an influx of school age children as communities grow in population. Economists and business professionals say it makes more economic sense to fully utilize existing facilities rather than to build additional ones (Ballinger & Kneese, 2006). Currently, school buildings are generally only used nine and a half months each year, five of every seven days, and 10 to 12 hours of each 24-hour period. When over-enrollment occurs and the community discussion turns to building additional classrooms, they should also consider that multi-track year-round education is one solution to overcrowding that makes greater use of existing facilities by using school buildings 12 months a year.

And finally, Ballinger and Kneese (2006) discussed the political aspect of this issue indicating that politically elected officials often tend to respond to community forces to include sometimes changing their stance on a particular issue if the community changes theirs. The example given is if a community were to lessen its opposition to the adoption of a year-round calendar, then elected officials that once frowned upon the idea may also lessen their opposition and adopt the position that it is now an idea whose time has come. To a large degree, school calendar modification is entering that stage of an idea whose time has come. Additionally, Ballinger and Kneese (2006) purported the notion that there is a strong likelihood that students who participate in year-round schooling experiences, upon becoming parents, will have first-hand knowledge of the benefits of reducing the summer vacation period and will lobby for calendar modification for their children. With all of these forces, educational, social, economic and political coming to bear on the calendar change issue, it becomes easier for elected officials to advocate for the diminution of the summer learning loss.

Offering all families alternative learning options can be provided at no additional costs. A simple schools-within-a-school structure illustrates that districts can, as one of many possibilities, provide a choice of (a) traditional, (b) modified flexible, or (c) personalized learning programs within one building. When traditionalists state that it is impossible to change the system, futurist Robert Theobald retorted, “It is time to do the impossible: the possible is no longer working.” For the near term, school buildings will continue in spite of the availability of on-line learning (Glines, 2012, p. 5).

Decreased funding is a reality that many American public schools and school districts wrangle with. Seeking ways to raise student achievement levels is a priority for these same schools. Striking a balance between the two that is acceptable to all of the involved stakeholders can prove quite challenging. Examining numerous options is an approach taken by many in educational leadership/administrative positions. One of these options is to find economically feasible ways to extend the amount of instructional time that students are exposed to. Time, defined in this context, could be using additional minutes within each school hour for instruction, additional hours each school day, or even additional days per school year. Another time related option would be to more evenly distribute the instructional versus the vacation time over a calendar year by abandoning the ingrained concept of a school year with an extended vacation period. In other words, make instructional use of the physical school building all year long.

In a May 2015 article, “The Impact of Learning Time on Academic Achievement,” published in *Education and Urban Society*, Su Jin Jez and Robert W. Wassmer wrote:

As schools aim to raise student academic achievement levels and districts wrangle with decreased funding, it is essential to understand the relationship between learning time and academic achievement. Using regression analysis and a data set drawn from California’s

elementary school sites, we find a statistically significant and positive relationship between the number of instructional minutes in an academic year and school-site standardized test scores. Fifteen more minutes of school a day at a school site (or about an additional week of classes over an academic year) relates to an increase in average overall academic achievement of about 1%, and about a 1.5% increase in average achievement for disadvantaged students. This same increase in learning time yields the much larger 37% gain in the average growth of socioeconomically disadvantaged achievement from the previous academic year. Placing this impact in the context of other influences found important to academic achievement, similar increases in achievement only occur with an increase of fully credentialed teachers by nearly 7 percentage points. These findings offer guidance regarding the use of extended learning time to increase academic performance. Moreover, they suggest caution in reducing instructional time as the default approach to managing fiscal challenges. (p. 284)

As noted above, even recent research continues to reveal an emphasis on elementary and disadvantaged students. Keith Zvoch and Joseph J. Stevens (2015) conducted a study on the identification of summer school effects by comparing the in- and out-of-school growth rates of struggling early readers in the first and second grades for some 250 students. Their study revealed that oral reading fluency increased during each period of schooling, with the most rapid increase occurring during the intensive summer school intervention period. The gains in reading fluency observed during periods of schooling contrasted with periods of stagnation or loss when students were not in school during each of the two summer breaks. The observed pattern of learning suggests that for the struggling readers studied, schooling “mattered” regardless of when in the calendar year it was experienced (Zvoch & Stevens, 2015).

Having conducted an experiment in Wake County, North Carolina, McMullen, Rouse, and Haan (2015) reported finding evidence of a positive impact of year-round calendars for the lowest-performing students. They also indicated that year-round school calendars that redistribute the 180 school days more evenly across the calendar year are growing in popularity (McMullen et al., 2015), while in other areas of the country, Florida in particular, Bussard (2015) mentioned significant numbers of schools reverting back to a traditional calendar; all of which reinforces the notion of each school and or school district having to do what works best for them. Disadvantaged elementary students appear to be the area where an increase in instructional time often proves to be somewhat beneficial with regards to raising student achievement levels based on test scores. When the total body of research on this topic of academic calendar comparison is examined, it becomes obvious that there is no one size fits all solution to raising student achievement levels. Research continues to exist revealing a wide variety of experiments all over the country that tinker with the amount of instructional time students are subjected to in a given calendar/school year. What is consistent is the fact that there is little or no consistency among the reported results. As stated, the only results that often show some student academic improvement, are with disadvantaged elementary students.

It is vital that researchers look at academic performance results of all grade levels to determine if year-round education is effective as well as requiring necessary implementation for each grade (Pedersen, 2015). This examination has virtually remained non-existent or has only been conducted on a very limited scale at the secondary level. Indeed, most of the research that has been conducted regarding year-round education has targeted the elementary and middle grade populations. The minimal look into high school level results does not support that academic gains are being made at that level. “In fact, some of the unplanned and supplementary

analyses show that year-round high school students actually had lower passing rates than their traditional peers on standardized tests” (Pedersen, 2015). Accordingly, this gap in the research warrants additional examination, providing foundation for this study. Pederson found that in most cases where a year-round calendar was implemented at a secondary level, it was done so in order to address an overcrowding issue as opposed to focusing on improving academic achievement.

The pursuit of common goals can sometimes be difficult to achieve when the number of people involved is many. Each individual will tend to view the goal from their own personal perspective. In the case of attempting to improve student academic achievement levels on standardized tests through the use of implementing a year-round calendar by changing from a traditional school calendar, those affected by and involved in the process are several. While the students, faculty, staff, school level administration, district level administration, parents, political, safety, security, transportation, business and entertainment people within a community may all agree that improved student academic achievement is a worthy goal, their reasons and methods for moving in that direction may vary considerably depending on their own perspectives. While difficult, it is vitally important that all of these stakeholders are given an opportunity to be heard and weigh in on any potential decision that is being contemplated by a school or school district to make a change to an existing school calendar. The variables that can be, and often are, factored into a decision such as this, can be game changers that sometimes steer a community off the path of improved student achievement. Pederson (2015) mentioned the region of the country as an important variable, as in some places, summer industries that rely on student workers are crucial to the local economy. Extreme temperatures often play a role affecting the costs of climate control. Summer athletic programs and traditional family vacations

are often possible because the parent's vacation time coincides with the school vacation time. "These social influences tend to have greater impact in determining if a school will move to a year-round schedule than do potential academic benefits" (Pedersen, 2015).

Several questions can be raised about the usefulness of additional instructional time in the classroom. In a compilation of research done by Bussard (2014), an emphasis is squarely placed on the quality of instructional time, not just on creating additional instructional time, but ensuring the value of such time is truly contributing to the learning effort as opposed to what some refer to as seat time. If the current allotted instructional time, usually 180 days in a traditional school academic calendar, is not producing the desired academic results on standardized tests, then before one simply adds more of the same type of instructional time, it is imperative that the quality of the time be examined. Again, pursuing such an examination will undoubtedly produce a wide variety of results, with every teacher possessing different types and levels of teacher education and certification, different years of experience, different teaching and delivery styles, and with different schools and districts subscribing to a different emphasis on different parts of different curriculums, the amounts and levels of educational rigor will vary greatly, contributing to substantial differences in the type and quality of instructional time. In looking at this concept of quality time versus time, Bussard also incorporated an international perspective as to how some foreign schools compare to American schools. Nancy Karweit (Bussard, 2014), a research scientist at Johns Hopkins University believed that adding more days to the school calendar is no guarantee that additional time will be used for better education. She mentioned that due to limited school resources other reform options have a greater potential payoff than simply keeping the school doors open for a longer period of time (Bussard, 2014).

Six researchers collaborated while conducting research for the Rand Educational Research Corporation to produce the First Outcomes from the National Summer Learning Study which gathered data during 2013-2014. Looking into why many students lose knowledge and skills over the traditional long summer break, research suggests that low-income students fall further behind over the summer than their higher-income peers (McCombs, Pane, Augustine, Schwartz, Martorell, & Zakaras, 2015). They worked in five urban school districts that included Boston, Dallas, Duval County (Florida), Pittsburg, and Rochester (New York). These districts offered free of charge, five to six week voluntary summer academic programs to large numbers of struggling elementary students. The results did show a significant positive effect on students' mathematics achievement at a rate of 11% of one standard deviation for those students who participated in the program as compared to those who did not. Reading improvement did not show a similar difference, it only improved 1% of one standard deviation. The researchers went on to suggest five factors that may help improve these outcomes. The factors included: consistent attendance and more hours of instruction led to better outcomes in the area of mathematics, and teachers with grade level experience, site orderliness, and instructional quality were significant contributing factors for reading improvement. Suggested next steps for school districts included: planning programs that run five to six weeks, schedule 60-90 minutes of mathematics per day, hire effective, qualified teachers, and maintain positive student behavior (McCombs et al., 2015).

Some subscribe to the myth that more time means more learning. Bussard (2014) pointed out that American students actually get more instructional time in the classroom than their peers in 15 other Western countries. "Higher test scores of the students in many of those countries

than those of U.S. students have been the basis for support of a longer school year by U.S. school reformers” (Bussard, 2014). Bussard also recognized that

Other reports show that while the school-year of Pacific Rim and European competitors are longer, a closer examination reveals they don’t actually receive more instructional time in the classroom. Counted in the extra days of their school years are club activities (what Americans regard as after-school activity), field trips or even the time for required child labor to maintain, clean and repair the schools.

Further research into this topic of calendar comparison/extended learning time/summer learning loss and a variety of other labels that have been attached to the concept that spending more time in an instructional environment should increase learning, continues to reveal three basic trends. Those trends include the overwhelming vast majority of said research is conducted at the elementary level, that any benefit that is realized from additional instructional time is normally seen in children who are in categories labeled as disadvantaged, students performing below standards, low income, or of a lower socioeconomic status (SES), and that very little research has been conducted at the high school level. Any brief mention one may stumble across of this topic being examined at the higher secondary grades is inevitably coupled with a brief description of status-quo being maintained or no academic improvement being realized. No exception to, and in corroboration of this information is a 2014 meta-analysis that initially looked at more than 7,000 studies, sorted them by scientific rigor, and identified 30 that used research designs capable of yielding strong evidence about the outcomes of increased learning time (Kidron & Lindsay, 2014). The definition used by Kidron and Lindsay for increased learning time, included a variety of schools and programs that implemented either out-of-school programs (before-and after-school and weekend programs); summer school; schools with longer

school days, weeks, or years; and year-round schools. These schools and programs provided additional instruction in English language arts, math, and other subjects and were designed to enhance students' academic interests and success.

The meta-analysis was guided by the five following research questions: (a) What extent do different types of extended learning approaches affect student outcomes?; (b) Do learning program characteristics such as teacher-student ratio, qualifications and instruction approach affect student outcomes?; (c) Is increased learning time effective for at risk students?; (d) Is increased learning time effective for urban, suburban, and rural schools alike?; and (e) Is increased learning time effective for both elementary and secondary grade levels? This last question is also partially explored in this study.

The findings across these studies were combined using meta-analysis techniques and produced the following results: Although the results were small, extended learning time programs did improve math and literacy achievement when instructed by certified teachers. The positive effect realized by out-of-school programs was on academic motivation vice achievement. Experiential/hands-on instruction was noted as having a positive effect on social-emotional skill development, and students' academic outcomes were positively affected by both the use of certified teachers and traditional instruction. Increased learning time can be effective in urban, suburban and mixed locales, on students performing below standards, and on the academic achievement of elementary students but a negative effect on literacy achievement of middle school students (Kidron & Lindsay, 2014).

Of the 71 references used in this meta-analysis report, all were published in 2013 or older. Although scarce, other recent research into this topic of calendar comparison and the use of increased instructional time such as year-round schooling, like this report, many of the

references were also used in this study which adds credence to the notion that even the most recent research into this topic yields information from the same or similar body of knowledge that this study relies upon, which further supports the emergence of the previously identified trends. Kidron and Lindsay also made mention of the importance that when educational administrators and or policy makers are contemplating decisions involving possible implementation of extending the learning time within their school or school district, that they first establish the goal they want to strive for.

This whole concept of adding learning time to existing curriculums is anything but a one-size-fits-all type of application. When discussing if calendar reform that may work at the lower grades would also be appropriate for higher grades, Pederson (2015) mentioned, “What works for one school may not be the most effective model for another school even within the same school district.” He further stated that ideally, schools should complete the selection, adoption, and implementation of their new calendars independently of other schools, but realistically this may not be possible as districts will want to keep the needs of the entire community in mind when making these decisions which may inject a holistic approach into the planning process. It is critical that each school and or school district develops and implements the calendar that works best for them and their students and meets their individual needs. Additionally, this report along with other studies recommends further research be conducted and is needed on increased learning time. These recommendations contributed to the prompting of this study, particularly a need to focus on the opposite sides of the emerged trends by taking a different approach and looking at high school level students that were not considered labeled as disadvantaged, students performing below standards, low income, or of a lower socioeconomic status.

Pedersen (2015) had little new information to add about how year-round schooling impacts high school students. He did acknowledge that high schools operate much differently from early childhood, elementary, and middle schools, giving rise to a different set of needs for these older students. Further, he reiterates the arguments that opponents to year-round schooling offer, such as, the problems posed for high school students seeking summer employment opportunities and the employers who rely on a summertime teenage workforce, including amusement parks, summer camps, and restaurants. Preparations for Fall athletic activities and college entrance is often a concern for older students as they participate in necessary programs such as physical training for sports teams, advanced placement, college classes, and internships. Pedersen suggested that intersessions and labs would better accommodate the needs of these students. In addition, coursework, community service, and job experience could all count toward the time and be done in a nontraditional way (Pederson, 2015).

Providing an additional perspective on the effects of a longer school year on educational outcomes for students and an examination of some research conducted in foreign countries will serve to include a more expansive view into the international aspects of calendar reform.

In his 2014 article, Parinduri examined both educational and employment outcomes of students exposed to a longer school year in Indonesia. He made reference to the always important quality of teachers and adequacy of learning materials, noting that spending more time in a school environment that is lacking in these areas could amount to a waste of time. Oftentimes in a foreign country, it is the government that determines the optimal length of a school term, and some countries can vary up to 60 days in this regard. Parinduri noted some examples, such as, East Asian countries implementing an academic calendar year that is 208 days in length as compared to the 180 days commonly used in the United States, even though

President Obama in September of 2010 said, issuing a message to students and teachers: “Their year in the classroom should be longer, and poorly performing teachers should get out” (Wemer, 2010). Indonesian children spend 240 days in a formal learning environment, as compared to 220 in Korea, 195-200 in South Africa, 190 days in Britain, and 187 days in Singapore (Parinduri, 2014).

After researching the effects of a governmentally imposed longer school year in Indonesia on grade repetition, educational attainment, employability, and earnings, Parinduri found that the longer school year decreased the probability of grade repetition and increased educational attainment along with an increase in the probability of working in formal sectors and wages in later life (Parinduri, 2014). Looking at school calendars as being linked to student achievement in some foreign countries such as Finland, South Korea, and Japan, when compared to the United States, researchers have found that a longer school year in Asia and Europe is linked to higher achievement (Pedersen, 2015). Pulling from several different resources, Pedersen compiled a continental comparison of school calendar differences that includes the following:

Africa.

Kenya. With each school day running from 8 a.m. to 4 p.m., the school year is divided into three terms of thirteen weeks each with a one month break between each term.

Nigeria. Running from January to December, the school year is divided into trimesters with a month off between each.

Asia.

China. September to mid-July is the typical school year, with summertime being used for either additional summer classes or studying for entrance exams.

Japan. The school year runs from April to March, when trimesters are conducted, with each trimester being separated from the next with a break for summer, winter, and spring.

South Korea. Two semesters of in session instruction time. The first runs from March to July and the second runs from September to February.

Australia. 200 days per year spanning from January to December with summer vacation being from mid-December to late January, with four, nine to eleven week terms.

Europe.

England. The six to seven week summer vacation (less than the United States), is under consideration for a possible reduction to four weeks.

Finland. Ten to eleven weeks of summer vacation.

France. Four, seven week terms run with a one to two week vacation between each term. This all takes place within a school year that runs from August to June.

Russia. In session from September to May with a three month vacation.

Middle East.

Iran. In session about 200 days from September to June.

Israel. A leader in school calendar reform, mandatory summer programs are implemented, and consideration is being given to adding additional grade levels.

North America

Canada. Vacation runs from the last week of June to the first week of September with the remainder being in session. However, Canadian politicians are urging schools to look into year-round academic calendars.

Mexico. In session from September to June, with the remaining time on vacation.

United States. Amidst reform, the majority of schools maintain a ten-to-twelve-week summer vacation that runs from mid to late June to the first week of September.

South America.

Brazil. The government requires 200 in session days, with the first term running February through June, and the second term starts in August.

Costa Rica. School year runs from February to December with a two-month vacation from December to February and a few weeks off in July.

What stands out in this comparison is the fact that many of the higher performing schools around the world appear to have a minimum of 200 days of instructional time built into their academic calendars (Pedersen, 2015). Emphasized is the fact that most countries try to reduce the amount of out-of-school time so as not to exceed one month. Pedersen stated “As American reformers look to their international peers, the way they allocate their breaks will be relevant and important information.” It was noted that Finland implements a summer break similar to that found in the traditional calendar used in the United States, while other countries like Israel and Canada are creating new programs to engage students in learning during the summer months.

Summary

Although there is a plethora of studies on year-round education, collectively it is fragmented and varied in its approach due to the large variety of formats available for its implementation and the large number of grade levels and targeted groups of students available to examine its impact. The enormity of conducting a study that includes all of these possibilities is not feasible. This section will provide a focused summary of the information presented above, to include what is currently known, what is not known, and how this study specifically addresses an identified empirical gap in the literature.

What is currently known is that the overwhelming majority of the literature reviewed pertaining to the topic of academic calendar options, particularly with regard to a comparison between a traditional calendar and a single track year-round calendar, reveals the following information. First, year-round school options are generally considered beneficial for improving student achievement for a variety of reasons. Secondly, the majority of the public schools in America continue to subscribe to a traditional school academic calendar. According to the latest information (School Year 2006-2007) provided by the NAYRE, there are 387 public school districts located within the United States and the District of Columbia that have schools actively implementing year-round education programs. This includes 2,764 individual schools for a total enrollment of 2,024,950 students. In the state of Virginia, the numbers are reported as five districts, 26 schools, and a total enrollment of 13,512. Within a specific school district in Virginia, one particular high school is included in the NAYRE report as implementing a year-round calendar. This school, along with another high school from the same district (that utilizes a traditional school calendar) was the subject of this study (NAYRE, 2009). According to Dr. Don E. Glines, co-founder of the NAYRE, the information presented here is the latest and the last reported figures by the NAYRE. Due to a lack of funding the NAYRE, as an organization, ceased to exist around the 2007 time frame. Subsequent to that time, Dr. Charles Ballinger, the other co-founder of NAYRE maintained archival statistical data for a few years. The web site operated by the organization was subject to its final update in April of 2009 (D. E.Glines, personal communication, January 21, 2014). Comparing the total number of public schools in the United States that operate on a year-round calendar from the last official report by the NAYRE in 2007 as 2,764 and the more recent figure reported by the U.S. Department of Education as 3,700, an increase of approximately 936 public schools have adopted the

implementation of a year-round calendar format over the past four school years, from School Year (SY) 07/08 to SY 11/12. Thirdly, the improved student achievement from a year-round education primarily occurs among the students who fall in a lower SES. Forth, specific studies comparing the difference, if any, on student achievement levels between students of a SES other than lower who have been exposed to the traditional calendar experience and those who have been exposed to the year-round calendar experience have not been accomplished to date. Accordingly, currently not known is if such a difference in academic achievement levels among twelfth grade students of a SES other than lower exists based on having been exposed to the different calendar experiences. Hence, this study was conducted to investigate this existing gap in the literature to help expand the knowledge on this topic within the field of education.

This review of literature has included textural information on several different types of alternative calendar options. In the interest of clarity, a more graphic representation of the two particular calendars (traditional and balanced or single track year-round) that are being compared as the subject of this study appear in Figure 2.2 below.

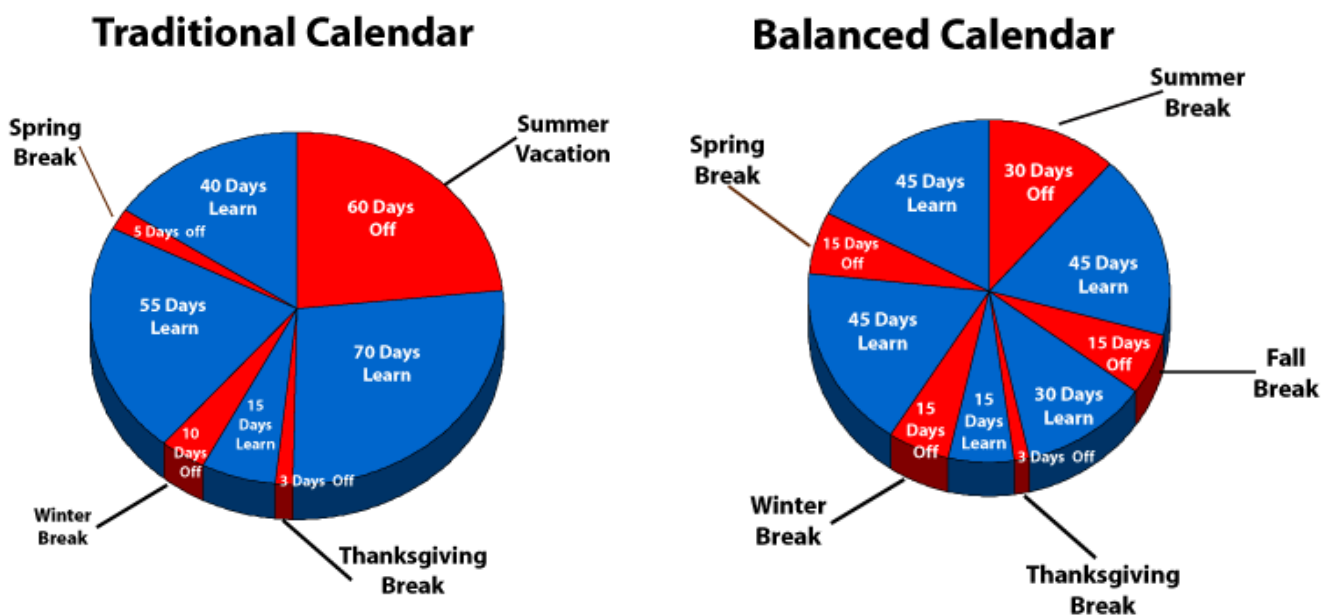


Figure 2.2. Calendar Comparison. The above charts compare the distribution of days in school and days on break for a nine-month traditional calendar and a modified or year-round calendar. Weekends are excluded from the charts with both models detailing a typical year of 258 work days (Monday through Friday). Both charts represent a standard school year of 180 days. The traditional calendar features a long summer vacation of 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. The balanced 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. Both calendars feature 180 days of instruction, with the modified calendar balancing the frequency of in-session days with days on break. The winter holiday and Thanksgiving break can be the same on both calendars.

CHAPTER THREE: METHODS

Overview

The nature and purpose of this study was to examine any differences that may exist between, and the relationships among, two different academic school calendars (traditional and year-round) that may have a statistical significance on student academic achievement. This chapter will present a discussion of the selected research design, list the research questions and corresponding hypotheses, describe the participants, setting, instrumentation, and procedures of data collection and analysis.

Design

A non-experimental, quantitative, ex-post facto causal-comparative research design was used to examine the implementation of one academic calendar over another (traditional versus year-round) on academic achievement. This research design was chosen because it attempts to explore a possible causative relationship between an independent variable (school calendar) and dependent variables (the overall SOL test scores of given twelfth-grade students, including four core content area sub-scores) on an occasion in which the researcher is unable to manipulate control of the independent variable (Gall et al., 2007). In a meta-analysis of research conducted on YRE, Cooper, Valentine, Charlton, and Melson (2003) noted that “weak research designs” prevent researchers from making “strong inferences about the effects of modified calendars” (p. 37). The overall effect size reported was positive but resided in the “trivial” range (p. 45). Similarly, the Editorial Projects in Education (EPE) Research Center (2004) characterized the available research on year-round schooling as “inconclusive” and “contradictory.” These design weaknesses could be based in the broad samples utilized. Accordingly, this research design, while still exploratory, was specifically strengthened by focusing narrowly on a sample that

includes students in each of the studied calendar options that had spent the entire four-year high school experience immersed in one calendar type. Since the researcher had no ability to manipulate or pre-determine the data sets in an ex-post facto causal-comparative study, an examination and comparison of the study groups based on collected demographic data was adopted to help achieve a degree of balance among the groups (Gall et al., 2007; Rovai et al., 2013).

In 1978, Heyns explored the issue of summer learning loss and achievement gaps. She concluded that there were achievement differences across social lines, race, ethnicity, and family income (Fairchild, 2011; Green et al., 2011; Heyns, 1978). Such demographic variables of race/ethnicity, socioeconomic status (SES), and gender were also examined by conducting a predictive correlation design to examine relationships when analyzing the groups from each participating high school senior class.

This ex post facto, non-experimental, quantitative research study employed a causal-comparative and correlational research design. Given the independent variables that were compared to reveal any differences in student achievement, this provided rational and opportunity to examine a possible cause and effect relationship between variables that existed, and justifying a causal-comparative and correlational research design as being the most appropriate for the conduct of this study (Gall et al., 2007; Rovai, Baker & Ponton, 2013). This type of research design allows for an un-manipulated or un-controlled study of the difference in calendar types (phenomena) after these experiences have naturally occurred. Once Institutional Review Board (IRB) clearance/permission was obtained, data was collected after obtaining written permission from the applicable school superintendent's office. The data were then used to form two groups of scores (one group from each of the participating schools). The criteria

used to establish the groups was having spent all four years of the high school experience at the same school which utilized the same calendar type (year-round or traditional) for the entire four-year period.

Quantitative analysis was used. Specifically, independent t-test, multiple regression and part/partial correlation were run. The t-test was used to determine the mean scores of each group, for each hypothesis tested. The independent t-test is a parametric procedure that assesses whether the means of two independent groups are statistically different from each other (Rovai et al., 2013).

If warranted, multiple regression tests were run to identify a correlation or predictive relationship between the dependent variable of test score and the independent variables of interest (calendar type, SES, gender, age, etc.). A post hoc test for part and partial correlation provided information on the extent to which each independent variable contributed to the variance in scores both individually and collectively.

Research Questions

RQ1: Is there a statistically significant difference between the Virginia standards of learning (SOL) test scores of twelfth grade students who were on a year-round school (YRS) calendar as compared to test scores of twelfth grade students who were on a traditional school calendar?

RQ2: Is there a statistically significant difference between specific core-content area test scores on the Virginia standards of learning (SOL) test of twelfth grade students who were on a year-round school (YRS) calendar as compared to test scores of twelfth grade students who were on a traditional school calendar?

Hypotheses

H₀1: No statistically significant difference exists between the end of year math test scores of twelfth grade students who have been schooled on a year-round calendar and twelfth grade students who have been schooled on a traditional calendar.

H₀2: No statistically significant difference exists between the end of year reading test scores of twelfth grade students who have been schooled on a year-round calendar and twelfth grade students who have been schooled on a traditional calendar.

H₀3: No statistically significant difference exists between the end of year science test scores of twelfth grade students who have been schooled on a year-round calendar and twelfth grade students who have been schooled on a traditional calendar.

H₀4: No statistically significant difference exists between the end of year social studies test scores of twelfth grade students who have been schooled on a year-round calendar and twelfth grade students who have been schooled on a traditional calendar.

Participants and Setting

Due to the fact that this study utilized existing data, the participants were studied after the fact (ex-post facto). Existing data was organizationally drawn from two high schools within a suburban northern Virginia school district; data for individual students (unit of analysis) was gathered. Convenience sampling (Rovai et al., 2013) was utilized as the schools that granted access to data were geographically close to the researcher. The test scores utilized in this study were selected from twelfth grade students who met the specified criteria of having attended their respective high school (year-round or traditional) for four years. They were selected from pre-existing same year senior students at two different high schools. Twelfth grade or senior students had specifically been selected due to the fact that they were the students who had the

highest opportunity and/or likelihood to have experienced their particular calendar format (traditional or year-round) for the greatest amount of time (all four years of high school). With high school seniors representing the target population, the pre-existing senior classes at the two different participating high schools represented the sampling frame (N), and a selected group of test scores from each of the two high school senior classes represented the sample (n) that was analyzed. The number of participants utilized was more than sufficient for this type of study (Rovai et al., 2013). With the average high school in the suburbs of northern Virginia having a graduating senior class size of approximately 300-500 students, selecting a sufficient, meaningful, and appropriate number of participants from each school contributed to the validity and reliability of the study. In quantitative causal-comparative research for correlation and regression, there should be at least 15 participants in each group to be compared, and the larger the sample the more likely the scores on the measured variables would be representative of the population (Gall et al., 2007). The work of Green in 1991 recommends a minimum of $N > 104 + k$ (the number of predictors) for tests of statistical significance of individual predictors (Green, 1991; Warner, 2013).

Gaining participation from these two high schools was achieved by obtaining written permission from the district superintendents' office to collect pre-existing data from the two schools. This ex-post facto study gathered previously achieved test scores of the senior classes from two northern Virginia suburban high schools. The administration of the Virginia Standards of Learning test would have been conducted in a regular classroom environment with appropriate lighting and temperature during a timed and supervised morning testing session during the spring semester.

The schools selected, once approved by the applicable superintendent, included two high schools from a particular suburban public school district in northern Virginia. The curriculum at both schools was aligned to the prescribed Virginia Standards of Learning (SOL), which also comprised the basis for the development of the SOL test, the achieved scores from which served as the dependent and criterion variable in this study.

Of the 196 schools in the Northern Virginia school district where this study was conducted, 22 of them were high schools. Table 3 depicts the demographics of the district's high school student population. Two of these high schools were selected to be the subject of this study due to the particular academic calendar that was utilized by the subject schools.

As per the data agreement between the Public School District that operated the two high schools, which are the subject of this study, and the researcher (see Appendix C), the table below contains requested division level data for SY 2007-08.

Table 3.1

Division Level High School Demographic Data for SY 2007-08

	High School (Grades 9-12)	
	Percent	Number
Students Race/Ethnicity		
Asian	18.6	9879
Black	10.8	5713
Hispanic	15.8	8361
White	50.2	26586
Hawaiian Pacific Islander	.1	30
Mixed Race	4	2141
Other	.2	104
Total	100	52975
Students Other Demographics		
LEP	10.5	5544
Special Education	13.6	7180
Free-Reduced Price Meals	21.4	11314
Students Gender		
Male	51.6	27437
Female	48.4	25628

Note. Division level high school demographic data for the county that possesses jurisdiction over the two high schools which were the subject of this study. Virginia On-time Graduation Rate: 91.2%.

Instrumentation

The purpose of the Virginia Standards of Learning (SOL) was to measure students' levels of academic achievement as they related to their ability to retain and recall prescribed curricular content that correlated with the given test. These standardized tests served as the dependent variable for research questions 1 and 2, which was administered to Virginia public school students at various grade levels and in different content areas.

An historical overview of the instrument's (SOL) origin and how and why it was developed would include the fact that its history began in 1994 when Virginia initiated significant reform of its K-12 educational system. This reform which evolved over a ten year period consisted of major elements such as high academic standards, tests to measure progress, and accountability. In 1995 the Virginia Board of Education adopted a set of statewide standards,

the Virginia Standards of Learning (SOL). In 2000 the Board recognized the need for regular review and evaluation of the SOL standards. Development of tests to measure the SOL began in 1996 with heavy involvement of classroom teachers, curriculum specialists, and other local educators throughout Virginia. A statewide census field test of the new SOL test items took place in the spring of 1997. The first administration of SOL tests took place in the spring of 1998, and the program has expanded since that time. For the instrument used for this study, a passing score for a Virginia SOL test was 400 based on a reporting scale that ranged from 0 to 600. A scaled score of 0 to 399 represented a non-passing score. A scaled score of 400 to 499 classified a student as proficient. A scaled score of 500 to 600 classified a student as advanced. In the case of high school seniors, a passing score had to be achieved in the four core content areas of English, math, science, and history/social science in order to qualify for graduation. A passing score for each core content area on the Virginia SOL test was 400 based on a reporting scale that ranges from 0 to 600.

For each subscale/reporting category, assessment scale scores were set between 0 and 50 with a 30 indicating approximate mastery of the content covered by that reporting category. A scaled score of 0 to 399 meant a student did not pass a test. A scaled score of 400 to 499 meant a student passed a test and was classified as proficient. A scaled score of 500 to 600 meant a student passed a test and was classified as advanced. These scores were the subject of this study and represented the dependent variable.

The EOC SOL test for each content area is presented in a multiple choice format (selecting the best of four possible answers). Sample questions are located in Appendix A. The Virginia SOL tests have been expertly reviewed and validated by implementing rigorous content and construct validity criteria. To evaluate each of the current assessments for construct validity,

factor analyses were performed. Exactly who the experts were that performed these analyses, other than committees consisting of personnel from Pearson and other Educational Testing Service (ETS) content specialists, Virginia educators, and the Virginia Department of Education, was not discussed in the Virginia Standards of Learning Statewide Student Assessments Technical Report (VSSATR, 2010-2011). Neither did the report mention the concept of conducting a principal component analysis (PCA) or any other specific statistical method for analyzing content and construct validity, (VSSATR 2010-2011, pp. 38-41). Additionally, content and construct validity were bolstered by soliciting input from Virginia teachers to help ensure that SOL test questions were consistent with the prescribed curriculum. The content validity ensured that all relevant content is included while excluding irrelevant content (Suen, 1990). The State ensured that the items in a test adequately represent the domain of items or the construct of interest as defined by the state prescribed curriculum. The construct validity test ensured that the measure of the construct behaves in ways that are consistent with expectations, underlying theory, or in a similar fashion as other measures of the construct (Peters, Crossen, & Anderson, 2000). Significant statistical data revealing the results of analysis of both test item and grade level SOL tests is available in the VSSATR 2010-2011(pp. 38-41). This validation means that the test has been subject to the process of accumulating evidence to support intended inferences of test scores for their intended use. Validation embraces all of the experimental, statistical, and philosophical means by which hypotheses and scientific theories can be evaluated (Messick, 1989). The test also had its level of internal consistency reliability coefficients rated at .85 and higher which are above the desired lower limits of .70 based on the Cronbach's Alpha scale of reliability (Virginia Department of Education, 2013; VSSATR, 2010-11). The reliability for each content area (English, mathematics, science, and history/social science) have met this

same standard being analyzed through the lenses of five concepts of reliability: Classical test theory (CTT), Alpha and Stratified Alpha, Standard Error of Measurement (SEM), Decision Consistency and Accuracy at the Pass/Proficient Cut Score, and Inter-Rater Reliability. However, corresponding data regarding reliability coefficients by specific content area is not included in the VSSATR.

Procedures

After submitting an IRB packet and gaining both IRB and site approval (see Appendices B and D), the researcher executed the research. The procedure started with obtaining written permission from the applicable district superintendent's office to access, collect, and publish the data of interest. The data requested was one year (the same and most current year available at the beginning of this research project) of the EOY/EOC SOL test scores from the senior classes of the two participating high schools. It was requested that any personally identifiable information of the students be redacted and only the actual scores, the content areas tested and demographic information, such as age, race, ethnicity, gender, and possibly socio-economic status (SES as determined by participation in the Virginia free or reduced lunch program) be released. The researcher also solicited from guidance personnel the number of years each senior had attended that school (four, three, two, or one), as this information played a role when determining which students met the study criteria of having experienced a given calendar type for a minimum of four academic years. After approval to collect the data was granted, the next step was to actually collect the archival data from whatever source the district superintendent's office directed. This was accomplished by district personnel pulling recorded data from an electronic central repository that the district office maintains. Once the schools submitted the SOL test score results for the participating students in each of the four academic content areas

(math, science, reading, and social studies), these recorded data were electronically collated at the district level where they are maintained in a central repository. With these data remaining resident within said repository, future access by other researchers is possible should a need arise for this study to be replicated. The data were then forwarded to the researcher and the obtained data were then stored on a password-protected computer and analyzed.

Data Analysis Independent t -tests to compare the means of the two populations' SOL scores for a statistically significant difference (the means of the test scores for year-round calendar students and traditional calendar students) was the most appropriate choice to test each hypothesis (Rovai et al., 2013). The t -test allowed the researcher to compare the sample means on the outcome or dependent variable for the year-round versus the traditional calendar groups (M_1 vs. M_2) to assess whether the difference between the means was statistically significant (Warner, 2013). This statistical analysis was repeated for hypotheses numbers 1 through 4. To determine any statistically significant difference, the alpha level was set at ($p = .05$) and any practical difference (effect size) was measured using Cohen's d to determine the standardized difference between the two means (Rovai et al., 2013). Additionally, histograms were run for each hypothesis to determine whether a distribution of scores were significantly different from a *normal distribution*. And finally, each hypothesis was subjected to a Levene's test which tests the hypothesis that the variances in different groups are equal (i.e. the difference between the variances is zero). A significant result would indicate that the variances are quite different and the *homogeneity of variances* would have been violated.

Addressing the statistical analysis techniques and data screening for hypothesis **H₀1**: which states that no statistically significant difference exists between the SOL end of year math test scores of twelfth grade students who have been schooled on a year-round calendar and

twelfth grade students who have been schooled on a traditional calendar, the data screening included the examination of histograms for each data set for normality of distribution which included Q-Q plots to test for extreme outliers.

Addressing the statistical analysis techniques and data screening for hypothesis **H₀2:** which states that no statistically significant difference exists between the end of year reading test scores of twelfth grade students who have been schooled on a year-round calendar and twelfth grade students who have been schooled on a traditional calendar, the data screening included the examination of histograms for each data set for normality of distribution which included Q-Q plots to test for extreme outliers.

Addressing the statistical analysis techniques and data screening for hypothesis **H₀3:** which states that no statistically significant difference exists between the end of year science test scores of twelfth grade students who have been schooled on a year-round calendar and twelfth grade students who have been schooled on a traditional calendar, the data screening included the examination of histograms for each data set for normality of distribution which included Q-Q plots to test for extreme outliers.

Addressing the statistical analysis techniques and data screening for hypothesis **H₀4:** which states that no statistically significant difference exists between the end of year social studies test scores of twelfth grade students who have been schooled on a year-round calendar and twelfth grade students who have been schooled on a traditional calendar, the data screening included the examination of histograms for each data set for normality of distribution.

CHAPTER FOUR: FINDINGS

Overview

The key components that comprise this chapter include a statement of the research questions, the null hypotheses investigated, an explanation of the descriptive statistics utilized in analyzing and presenting data, and the results of said analysis. The results are revealed through the organized and chronological restatement of each hypothesis. Charts and graphs are included to visually enhance the clarity of the information presented.

Research Questions

RQ1: Is there a statistically significant difference between the Virginia standards of learning (SOL) test scores of twelfth grade students who were on a year-round school (YRS) calendar as compared to test scores of twelfth grade students who were on a traditional school calendar?

RQ2: Is there a statistically significant difference between specific core-content area test scores on the Virginia standards of learning (SOL) test of twelfth grade students who were on a year-round school (YRS) calendar as compared to test scores of twelfth grade students who were on a traditional school calendar?

Null Hypotheses

H₀1: No statistically significant difference exists between the SOL end of year math test scores of twelfth grade students who have been schooled on a year-round calendar and twelfth grade students who have been schooled on a traditional calendar.

H₀2: No statistically significant difference exists between the SOL end of year reading test scores of twelfth grade students who have been schooled on a year-round calendar and twelfth grade students who have been schooled on a traditional calendar.

H₀₃: No statistically significant difference exists between the SOL end of year science test scores of twelfth grade students who have been schooled on a year-round calendar and twelfth grade students who have been schooled on a traditional calendar.

H₀₄: No statistically significant difference exists between the SOL end of year social studies test scores of twelfth grade students who have been schooled on a year-round calendar and twelfth grade students who have been schooled on a traditional calendar.

Descriptive Statistics

When comparing the two sets of Virginia SOL test scores from the senior classes of the two high schools studied, the mean was reported as the measure of central tendency, along with the standard deviation as the measure of variability, as presented in Table 4.1. Sample sizes were also reported. As shown, mean values were higher in the year-round group in all cases, with these differences being substantial in the case of math scores, small in the case of science and reading scores, and negligible in the case of social studies scores.

Table 4.1. Independent-Samples *t*-Test: Descriptive Statistics

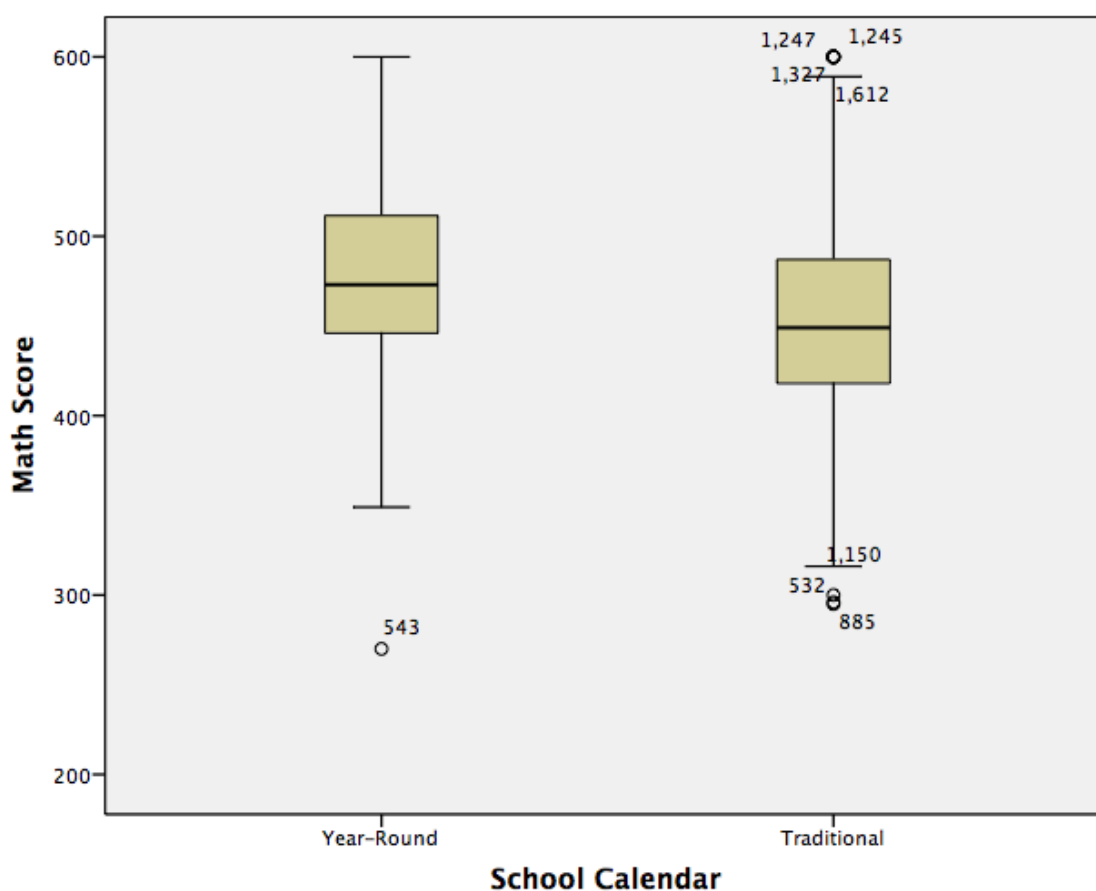
	Year-Round			Traditional		
	<i>N</i>	Mean	<i>SD</i>	<i>N</i>	Mean	<i>SD</i>
Math	635	479.24	51.656	1074	455.75	53.101
Science	625	449.59	46.838	1029	441.87	45.040
Reading	268	494.41	58.101	438	491.09	62.634
Social Studies	662	481.97	55.901	1157	480.50	55.316

Results

Data Screening

Initially, a series of diagnostic tests were conducted in order to determine whether the assumptions of the independent-samples t -test were violated in any of these four cases. This process began by conducting a series of boxplots on these data.

Figure 4.1. Distribution of Math Scores



In Figure 4.1 above, and in Figures 4.2, 4.3, and 4.4 below, the green boxes represent one half of the total number of scores provided for that school. The black line near the center of the green box represents the median test score, accordingly, the scores in each green box above the median are those scores that fall in the second quartile. The scores in each green box below the

median are those scores that fall in the third quartile. The scores that fall between the top of the green box and top black line represent the top quartile, and conversely, those falling between the bottom of the green box and the bottom black line are those scores that fall in the bottom quartile of the normal test score distribution. Figure 1 above depicts the distribution of math scores. Here, there are not many outliers, nor are they significantly far away (approximately 100 points) from the median score. Accordingly, given the large number of scores in the data set, these outliers are not considered to possess any appreciable impact on data distribution.

Figure 4.2. Distribution of Science Scores

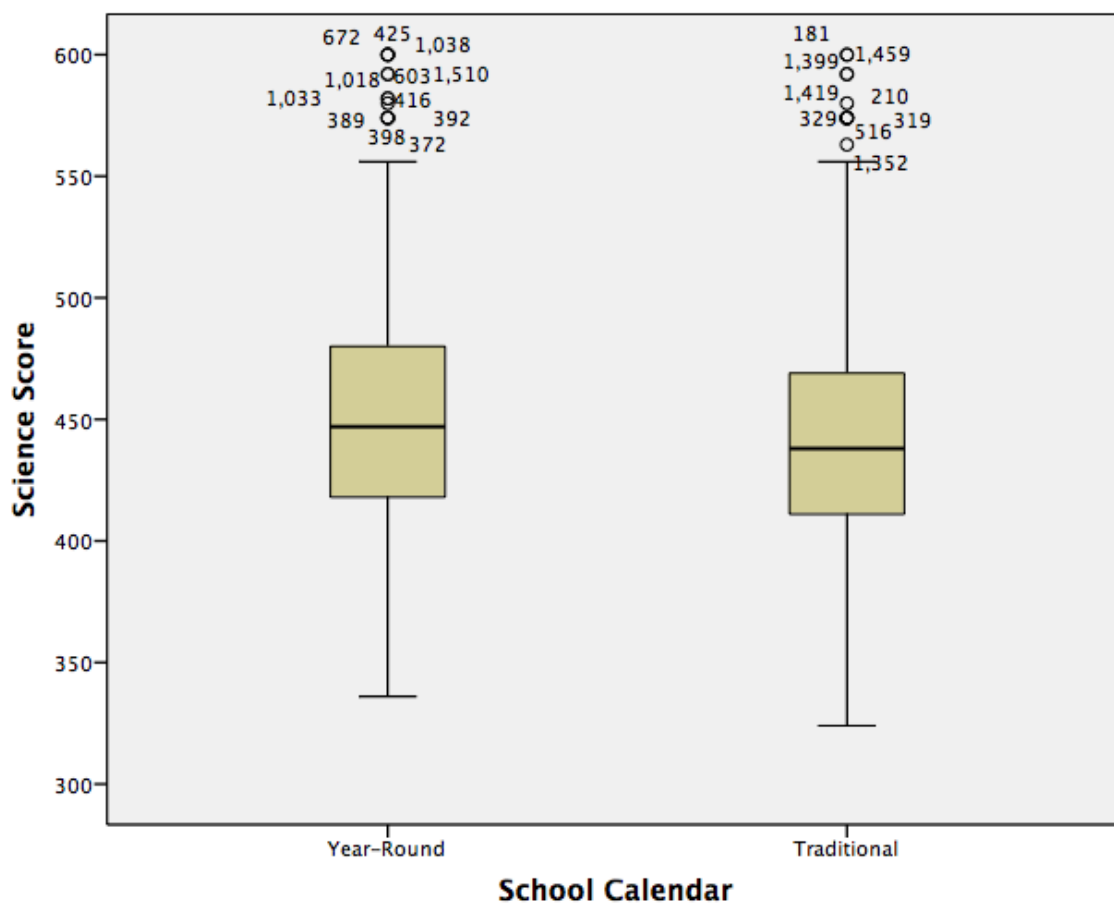


Figure 4.2 above depicts the distribution of science scores. Here again, considering the large number of test scores provided in the data set, these outliers are not considered to possess any

appreciable impact on data distribution. The low number of outliers in each set of test scores, tend to cancel each other out, causing no significant change in data distribution.

Figure 4.3. Distribution of Reading Scores

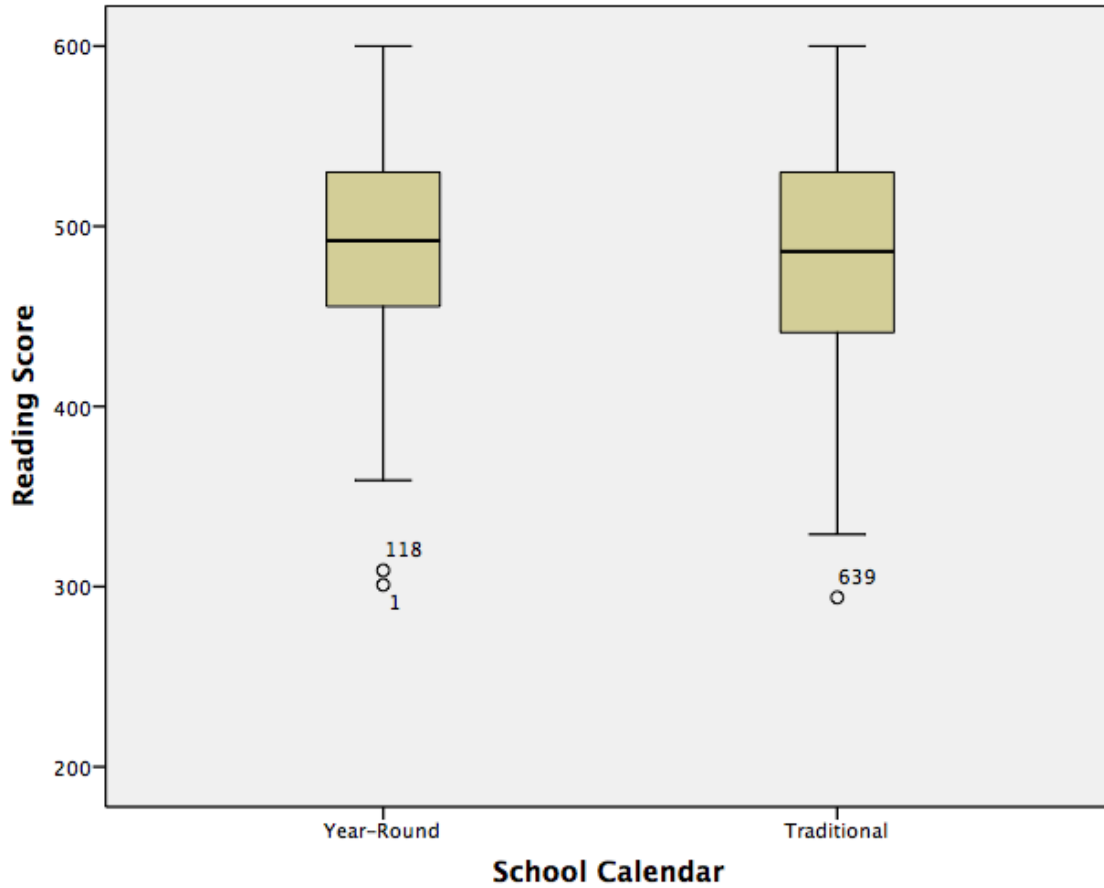


Figure 3 above depicts the distribution of reading scores. With only three outliers depicted, this distribution of test scores is well within the range of normality.

Figure 4.4. Distribution of Social Studies Scores

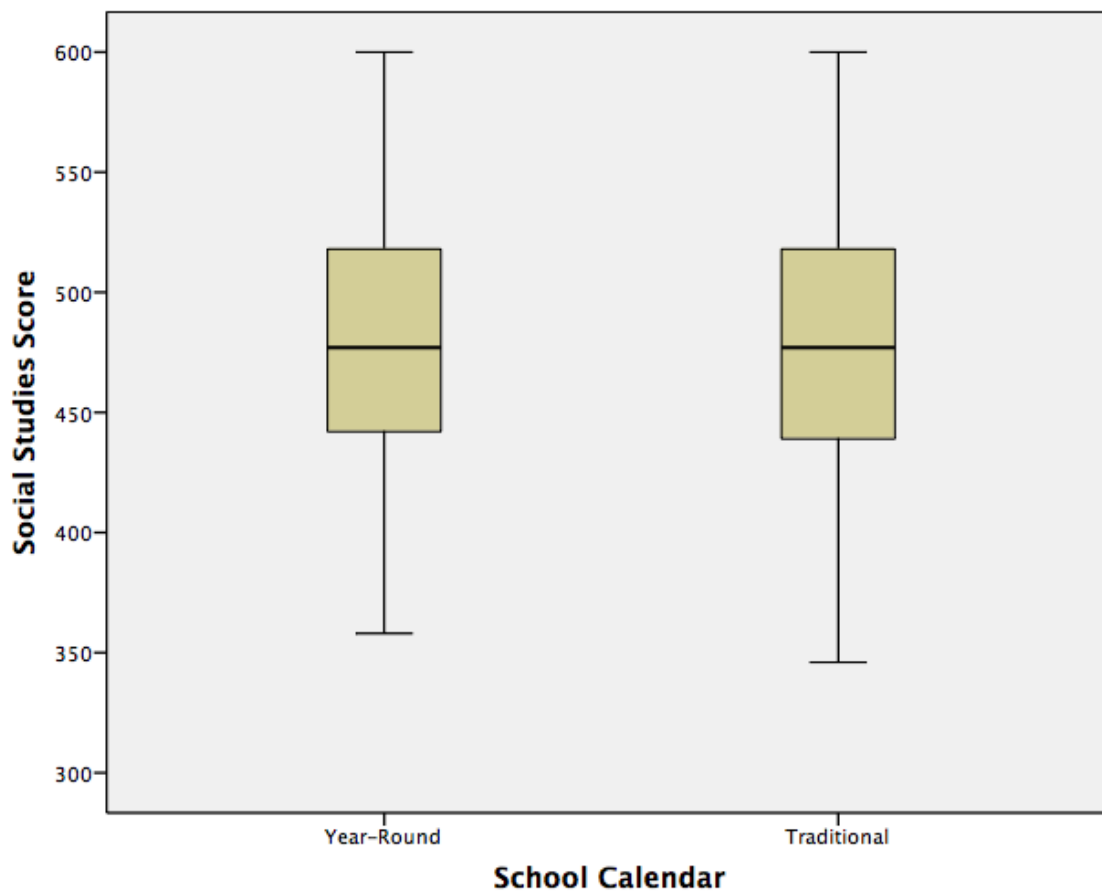


Figure 4 above depicts the distribution of social studies scores with no outliers indicated.

A series of histograms were also run on these measures in order to determine the extent of normality present with respect to these data. These figures are presented below, with these histograms indicating normality with respect to all four measures.

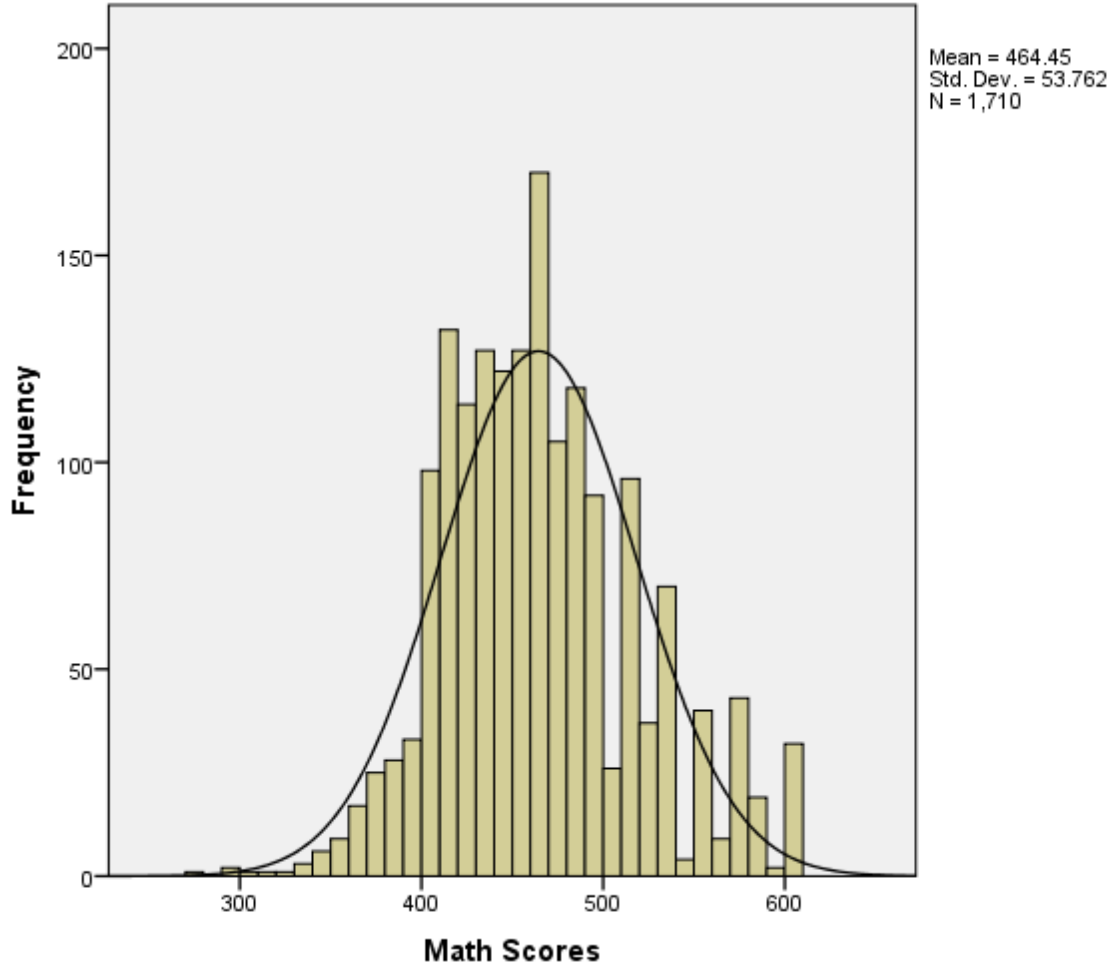


Figure 4.5. Shapiro-Wilk Histogram Depicting the Combined, Year-Round and Traditional Academic Calendar, Normality of Math Scores Data Distribution

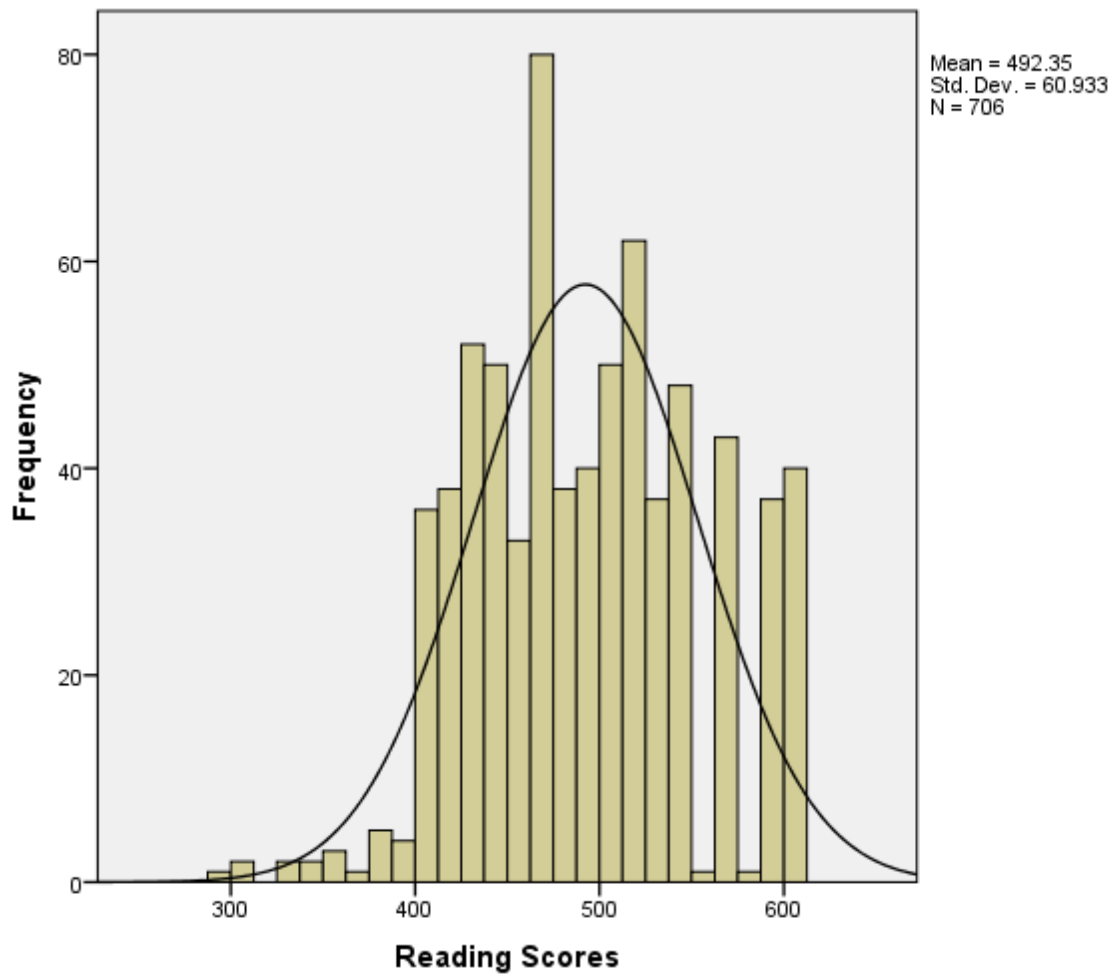


Figure 4.6. Shapiro-Wilk Histogram Depicting the Combined, Year-Round and Traditional Academic Calendar, Normality of Reading Scores Data Distribution

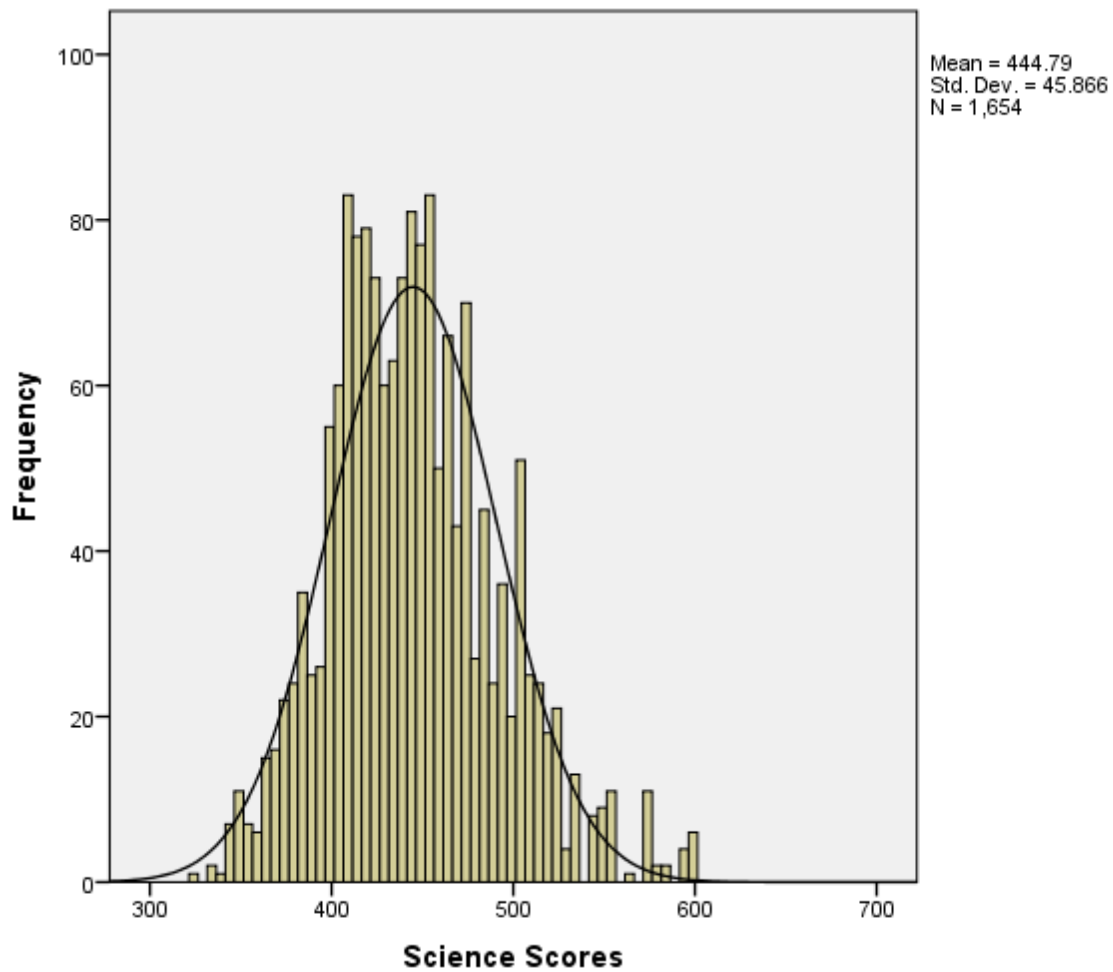


Figure 4.7. Shapiro-Wilk Histogram Depicting the Combined, Year-Round and Traditional Academic Calendar, Normality of Science Scores Data Distribution

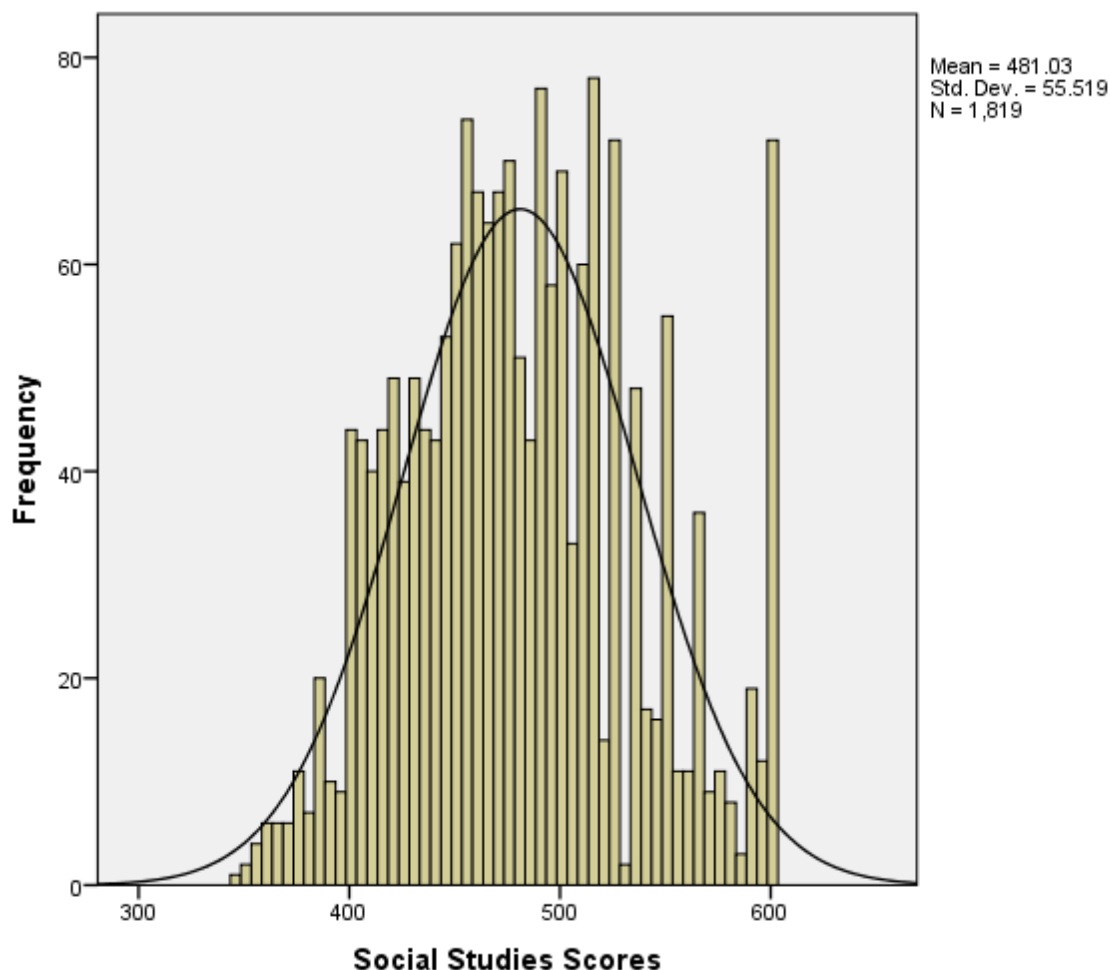


Figure 4.8. Shapiro-Wilk Histogram Depicting the Combined, Year-Round and Traditional Academic Calendar, Normality of Social Studies Scores Data Distribution

Homogeneity of Variances – This concept represents the assumption that the variance of one variable is stable (i.e. relatively similar) at all levels of another variable. This was tested in relation to all four independent-samples *t*-tests using Levene's test. Significance was not indicated with respect to either math scores, $F(1707) = 1.170$, $p = .279$, science scores, $F(1652) = 1.208$, $p = .272$, reading scores, $F(704) = 3.692$, $p = .055$, or social studies scores, $F(1817) = .248$, $p = .619$. The lack of statistical significance in relation to this test indicates that the assumption of the homogeneity of variances was not violated; therefore, with respect to these four independent variables, this assumption was not violated in any case.

Hypothesis Testing

For hypothesis **H₀1** the sample size provided in the math data included inferential statistics of 635 for the year-round school and 1074 for the traditional school. From which, inferences and conclusions can be drawn about the population from which the sample was drawn.

For hypothesis **H₀2** the sample size provided in the reading data included inferential statistics of 268 for the year-round school and 438 for the traditional school. From which, inferences and conclusions can be drawn about the population from which the sample was drawn.

For hypothesis **H₀3** the sample size provided in the science data included inferential statistics of 625 for the year-round school and 1029 for the traditional school. From which, inferences and conclusions can be drawn about the population from which the sample was drawn.

For hypothesis **H₀4** the sample size provided in the social studies data included inferential statistics of 662 for the year-round school and 1157 for the traditional school. From which, inferences and conclusions can be drawn about the population from which the sample was drawn.

A series of four independent-samples *t*-tests were conducted in order to determine whether there were differences in content area scores on the basis of school calendar. Significant mean differences were found with respect to math scores, $t(1707) = 8.926, p < .001$, as well as science scores, $t(1652) = 3.327, p < .01$. However, significant mean differences were not found with regard to reading scores, $t(704) = .702, p = .483$, or social studies scores, $t(1817) = .543, p = .587$. With regard to math and science scores, a significantly higher mean score was found in students exposed to a year-around school calendar as opposed to a traditional school calendar.

Additionally, with regard to measures of effect size, with respect to the two significant *t*-tests, a Cohen's *d* of .448 was found with respect to math scores, with a Cohen's *d* of .168 found with respect to science scores. These effect sizes translate to small effect sizes in both cases.

Null Hypothesis One

The first null hypothesis stated the following:

H₀1: No statistically significant difference exists between the SOL end-of-year math test scores of twelfth grade students who have been schooled on a year-round calendar and twelfth grade students who have been schooled on a traditional calendar.

A *t*-test was run to determine if there was a statistically significant difference between the math proficiency scores of the students who attended the traditional school and the students who attended the year-round school. A Levene's test was also run to test for homogeneity of variances which failed to achieve statistical significance, $F = 1.170$, $p = .279$. The total sample size was 1709 respondents, with 635 in group 1 and 1074 in group 2. The *t*-test indicated a significant difference between the mean scores of those in the year-round dataset and those in the traditional dataset, $t(1707) = 8.926$, $p < .001$, two-tailed. There was a small effect size, Cohen's $d = 0.448$. This null hypothesis was rejected.

Null Hypothesis Two

The second null hypothesis consisted of the following:

H₀2: No statistically significant difference exists between the SOL end-of-year reading test scores of twelfth grade students who have been schooled on a year-round calendar and twelfth grade students who have been schooled on a traditional calendar.

A *t*-test was run to determine if there was a statistically significant difference between the reading proficiency scores of the students who attended the traditional school and the students

who attended the year-round school. A Levene's test was also run to test for homogeneity of variances which failed to achieve statistical significance, $F = 3.692$, $p = .055$. The total sample size was 706 respondents, with 268 in group 1 and 438 in group 2. The t -test did not indicate a significant difference between the mean scores of those in the year-round dataset and those in the traditional dataset, $t(704) = .702$, $p = .483$, two-tailed. There was a small effect size, Cohen's $d = 0.055$. The researcher failed to reject the null hypothesis.

Null Hypothesis Three

The third null hypothesis posited the following:

H₀3: No statistically significant difference exists between the SOL end-of-year science test scores of twelfth grade students who have been schooled on a year-round calendar and twelfth grade students who have been schooled on a traditional calendar.

A t -test was run to determine if there was a statistically significant difference between the science proficiency scores of the students who attended the traditional school and the students who attended the year-round school. A Levene's test was also run to test for homogeneity of variances which failed to achieve statistical significance, $F = 1.208$, $p = .272$. The total sample size was 1654 respondents, with 625 in group 1 and 1029 in group 2. The t -test indicated a significant difference between the mean scores of those in the year-round dataset and those in the traditional dataset, $t(1652) = 3.327$, $p < .01$, two-tailed. There was a small effect size, Cohen's $d = 0.168$. This null hypothesis was rejected in this case.

Null Hypothesis Four

The fourth null hypothesis posited the following:

H₀4: No statistically significant difference exists between the SOL end-of-year social studies test scores of twelfth grade students who have been schooled on a year-round calendar

and twelfth grade students who have been schooled on a traditional calendar. The very small difference favored the year-round calendar.

A *t*-test was run to determine if there was a statistically significant difference between the reading proficiency scores of the students who attended the traditional school and the students who attended the year-round school. A Levene's test was also run to test for homogeneity of variances which failed to achieve statistical significance, $F = .248, p = .619$. The total sample size was 1819 respondents, with 662 in group 1 and 1157 in group 2. The *t*-test did not indicate a significant difference between the mean scores of those in the year-round dataset and those in the traditional dataset, $t(1817) = .543, p = .587$, two-tailed. There was a small effect size, Cohen's $d = 0.026$. The researcher failed to reject the null hypothesis.

CHAPTER FIVE: CONCLUSIONS

Overview

In this chapter, first, a discussion of the results is presented in which these results are elaborated upon in additional detail and are also discussed in relation to previous literature conducted in this field. Comparisons and contrasts with this previous literature are also made within this section. Following this, the implications of this study are discussed. As this study focused specifically upon a comparison of two different school schedules, these implications therefore relate to how the use of the school schedule found to be superior within this current study may serve to provide positive benefits. Following this, the limitations of the current study are discussed, which include factors relating to the methodology used and the data collected, among other items. Finally, suggestions are provided for future research which could serve to further expand upon this area of literature.

Discussion

Regarding the four hypotheses presented, which state that no statistically significant difference exists between the SOL end of year test scores (math, reading, science, and social studies) of twelfth grade students who have been schooled on a year-round calendar and twelfth grade students who have been schooled on a traditional calendar, such a statistically significant difference was found in two out of the four cases tested. Restating each hypothesis in light of the results discussed in chapter four above, and taking into account the literature, other studies, and theory, the results partially contradict other studies (Frazier & Morrison, 1998; Graves, 2011; Green et al., 2011; Zvoch & Stevens, 2015) primarily due to the difference in population examined. Other studies often looked at elementary students in low income areas, whereas this study looked at high school seniors from a middle-to-upper income area. Attempts to compare

the findings of several of the studies identified in the literature review (chapter two) to the findings of this study proved a bit like comparing apples and oranges. Although the studies, like this one, involved the comparison of year-round verses a traditional academic calendar and any difference that the calendar may have had on the level of student academic achievement, the vast differences in the student populations, school geographic, demographic and sample sizes, render an effective comparison of minimal to no value. Other studies focused on either a large number of schools within a given state, low economic areas, minority ethnic groups, and/or were conducted at the elementary level. This study intentionally involved none of those criteria, and in an effort to bring a new and fresh perspective to the notion of calendar comparison, specifically sought to take an exact opposite frame of reference which included looking at high school students (specifically seniors). These students took a standardized test that is unique to the Commonwealth of Virginia, the Standards of Learning (SOL) test which tests four specific core content academic subject areas (math, science, reading, and social studies). These students came from only two schools that were geographically very close and were from a middle-to-upper socio-economic status. Except for the two different types of calendars, none of these criteria were utilized in the other studies. Regarding the focusing of these finding comparisons around individual hypotheses, none of the other studies utilized an instrument or standardized test that was broken down into the four main specific core content subject areas, which is how the hypotheses in this study have been set forth.

An example of the above discussion would include noting that the results of the first hypothesis which predicted a finding of no statistically significant difference between the SOL end-of-year math test scores of twelfth grade students who have been schooled on a year-round calendar and twelfth grade students who have been schooled on a traditional calendar, were only

able to be partially compared or related to similar studies. The reason for this is the uniqueness and difference of several of the variables in each study. For instance, Graves, J. (2011) which looked at the effects of year-round schooling on disadvantaged students and the distribution of standardized test performance, except for the examination of the year-round calendar and the standardized test performance, all other aspects of the two studies were substantially different, such as the sample population where Graves studied disadvantaged students from all California schools and found the year-round calendar to result in a negative impact on standardized test performance. On the other hand, this study focused on non-disadvantaged high school seniors from two demographically and geographically similar high schools in Virginia and found the calendar type to present a significant and positive impact on standardized test (SOL) performance.

Looking at the results of the second hypothesis which predicted a finding of no statistically significant difference between the SOL end-of-year reading test scores of twelfth grade students who have been schooled on a year-round calendar and twelfth grade students who have been schooled on a traditional calendar, this too can only be partially compared or related to similar studies. For example, Helf, S., Konrad, M., & Algozzine, B. (2008) examined the effects of summer vacation on reading achievement. Their sample included participants who were students in grades kindergarten through the second grade from six elementary schools in one urban school system in the southeastern region of the United States. They divided their participants into three groups 1) not at risk, 2) at risk controlled, and 3) at risk treatment. Their results showed no evidence of setback across a 10-week summer vacation for this sample of children, most of whom were struggling readers. Although the results of this study also show no significant reading performance achievement difference, again, the variables of the two studies

are quite different (i.e., K-2nd graders verses 12th graders), such a difference should be given consideration when attempting to make any comparisons between the two studies.

Hypothesis number three predicted a finding of no statistically significant difference between the SOL end-of-year science test scores of twelfth grade students who have been schooled on a year-round calendar and twelfth grade students who have been schooled on a traditional calendar. Within the current study, this null hypothesis was rejected on the basis of the results obtained. According to Wu, A. D., & Stone, J. E. (2010), who looked into whether or not year-round schooling would affect the outcome and growth of California's API (standardized test) scores. They examined 4,569 elementary schools over a six year period. Over half of the student population included in the sample were considered socio-economically disadvantaged. The schools included utilized a year-round calendar, had done so for the entire six year period of the study, and the same was true for the traditional calendar schools included in the study. The results were that following a year-round school calendar neither had an effect on the API performance nor on the growth rate. These results differ from the results of this study, while it must also be noted that the difference in variables were significant. When comparing the results of the two studies, one can see that Wu and Stone examined a large number of elementary schools with 51-88% of the students considered to be of a disadvantaged SES. This study, however, looked at seniors only, not considered from a lower SES, and only from two demographically and geographically similar high schools in Virginia.

The fourth hypothesis predicted a finding of no statistically significant difference between the SOL end-of-year social studies test scores of twelfth grade students who have been schooled on a year-round calendar and twelfth grade students who have been schooled on a traditional calendar. Fairchild, R. (2011) examined the results of several studies that looked at

why and how communities should focus on summer learning. Again, this effort was focused at the elementary level and was examining efforts to help improve the academic performance of disadvantaged students. It examined a variety of summer educational programs to include adjustment to the academic calendar geared at reducing an absence of intellectually stimulating activity during the summer months. The results showed that overall, students completing remedial summer programs were shown to have scored about one fifth of a standard deviation higher than the control group on outcome measures. Comparing the results of Fairchild's study to the results of this one, it is once again, the difference in variables that make any meaningful comparison not worthy of much consideration.

More broadly, while still containing some differences in comparison with the present study, other studies that did focus on a high-school population were found and are discussed here in order to provide comparisons and contrasts with sample more closely related to the present study. First, in studies which have examined entire school districts, including high schools, those with year-round calendars report achievement that is as good or better than those in their September-June cohorts (Ballinger, Kirschenbaum, & Poimbeauf, 1987). For example, student achievement scores in a large Los Angeles Unified School Districts year-round schools have been found to evidence a higher rate of gain as compared with their September-June cohorts. A similar pattern was found and used in the year-round schools. Similarly, the Oxnard (California) School District also showed achievement gains in the case of its year-round students as compared with their September-June cohorts. Achievement gains that were improved in year-around schools were found in districts in which a majority of students in the schools were from minority groups, with similar significant achievement gains also found in year-round schools in which white students composed the majority (Ballinger, Kirschenbaum, &

Poimbeauf, 1987). The results of the present study partially confirm those found in these other school districts.

When conducting an exhaustive review of the literature, as discussed in chapter two, it was suggested that implementing a year-round calendar as opposed to a traditional calendar could provide improvement in academic achievement (Ballinger & Kneese, 2006). The literature discussed in chapter two also revealed some disadvantages that contribute to year-round school operation (Carter, 1999; Glines 2002, Worthen & Zsiray 1994). However, key to the reviewed literature, one can see that the overwhelming body of previously conducted studies on this topic of academic calendar comparison was all virtually either conducted at the elementary level (Downey et al., 2008; Green et al., 2011; Helf, Konrad, & Algozzine, 2008), involved a large number of schools (Graves, 2011; Wu & Stone, 2010), or was specifically conducted in a lower socio-economic area (Fairchild, 2011). Such studies tended to show that when students (particularly younger ones of lower socio-economic status) are given the opportunity to remain more academically engaged during the summer months that a positive effect occurs on their academic achievement level.

Accordingly, the researcher decided to approach this topic of academic calendar comparison from an entirely different perspective to see if similar advantages to implementing a year-round calendar also existed at the high school level, comparing a small number (2) of schools that drew a similar demographic student population from the same geographic area and that that area was not one considered to be largely populated with people of a lower economic status. Further, the researcher limited the data request (see Appendix C) to only twelfth grade students, thereby increasing the chance and probability of the study participants to have gained

experience in a particular academic calendar setting for all four or most of their high school years. The data request was agreed to and approved in Appendix D.

New insight that can be gleaned from the results of this study would be that the existence of a statistically significant difference between SOL end of year test scores of twelfth grade students who have been schooled on a year-round calendar and twelfth grade students who have been schooled on a traditional calendar was found at the high school level where the preponderance of the student body was not of a lower socio-economic status, and other demographic variables such as race, gender, age, ethnicity were of similar composition. Comparing these results with the preponderance of the existing studies on calendar comparison, which have been identified and examined in chapter two above, it is noted that the overarching focus of these studies, such as those conducted by Silva (2007), Evans (2007), Frazier and Morrison (1998), and Worthen and Zsiray (1993), was to examine student achievement differences, if any, on standardized tests among elementary students of a lower economic status that were exposed to either a traditional or a year-round academic calendar. A capsulated result of such studies indicates that the year-round calendar does offer a slight advantage to elementary students from a lower economic status. Comparatively, this study looked at the opposite end of the spectrum by examining student achievement differences, if any, on standardized tests among high school seniors from other than a lower economic status. These students were obviously older and had more time to develop study habits, more time to get used to one calendar type over another, and due to a higher economic status, could have potentially been exposed to more educational opportunities during the non-school periods of the year. Similar to the results of the elementary and lower SES comparative calendar studies, this study indicated that appreciable

statistically significant difference in student achievement existed between those seniors that were exposed to either the traditional or year-round academic calendar.

Implications

The implications that can be drawn from this study should help close the gap in academic calendar comparison research by adding to the body of literature within this area. Specifically, with the evidence found in the present study for the efficacy of a year-round academic calendar, educational administrators and policy makers who are in the business of making calendar type and implementation decisions for schools and school districts, may want to consider the possibility of implementing a year-round calendar when weighing fiscal constraints and student academic achievement levels. Also, the particular type of student studied here may have sufficient access to and opportunity for educationally engaging activities during the summer months, which may contribute to a more constant and consistent intellectual stimulation than those with less such exposure and opportunity. Additionally, older students (as opposed to the younger ones studied in previous studies) have had more time to develop individual and successful study habits which may present a negating factor to the amount of time dedicated to vacation. With the uniqueness of this study, comparing standardized test results of two different groups of high school seniors (one having experienced a traditional academic calendar, and the other having experienced a year-round academic calendar) it is recommended that similar future studies be conducted to see if these results will be repeated or if any possible trends can be established, which may tend to counter the majority of academic calendar comparison studies, which have focused on elementary students of a lower economic status.

Limitations

It is assumed that the instrumentation previously utilized by the two participating high

schools to obtain the EOY SOL test scores for the senior classes from each school has been shown to produce valid and reliable results by the Commonwealth of Virginia's Department of Education and is presumed to accurately measure a student's academic grasp of the prescribed curriculum to which the test correlates (VSSATR, 2010-11). It is also assumed that the test results from each school have been correctly recorded and that the students performed to the best of their ability.

It is assumed that the Commonwealth of Virginia has run the necessary statistical tests, according to classical and item response theories (IRT), to ensure the test produces valid and reliable test scores. It is also assumed that the schools have administered the tests according to the guidelines given by the state to ensure test conditions that produce valid and reliable results. Further, it is assumed that students that were eligible to be tested by alternative assessment methods have received such testing and are not represented in the test data.

Having selected two high schools to participate in the study that were located in the same geographic area (only 3.7 miles apart) and drew their student populations from the same neighborhoods in a northern Virginia suburb, it is assumed that the socio-economic, racial, ethnic, and gender demographics and students' academic ability levels for seniors at both schools are equally reflective of the diverse population and tend to render a credible level of validity to the study. The academic content at both schools is that which is prescribed by the Commonwealth of Virginia, and instructional content delivery methods are consistent with those sanctioned by the state and the certified, licensed educators it employs.

Because the populations of the two senior classes pre-existed prior to this study, no opportunity existed for the random assignment of participants. Additionally, extraneous confounding variables such as teacher attitude and delivery style, physical environment, order

and timing of classes, non-school factors, etc., could not be controlled for in this study. These variables prevent a conclusive cause and effect determination. However, the impact of some of these variables can be limited due to the close physical location and nature of the two schools chosen. An example would be the use and delivery of similar curricular content. Maturation was controlled for by obtaining data as to the number of school years (four, three, two, or one) that each twelfth grade student had been exposed to their particular school calendar and eliminating all but four year attendees. The populations were only representative of a suburban area in northern Virginia. Care should be taken not to generalize the results to dissimilar locals such as inner city or rural locations as invalid inferences may result (Rovai et al., 2013).

Inasmuch that the provided and studied data were archival, the extraneous variables that might normally pose a threat to internal and external validity were not known to the researcher, as the actual administration of the SOL tests was conducted some years prior to this study being conducted and were not administered by this researcher. Additionally, the data that were provided were void of the gender variable that was included in the initial data request. However, due to the fact that this study focused primarily on any possible impact that the calendar type may have on academic achievement levels, the lack of gender identification is only considered as a minimal limitation and would not have changed any overall findings.

Not so much a limitation, but more of a deviation from the initial intent of the study, and also posing no impact to the study's relevance, is the fact that having initially intended to compare the high school senior SOL test scores from two different high schools each from a different but neighboring Northern Virginia school district, for convenience and acquiescing to the districts' suggestion, two high schools from the same Northern Virginia school district that employed different academic calendars (one year-round and one traditional) were actually used

in the study. Also discovered during the data collection phase of the study was the fact that the high school representing the year-round calendar, used such a calendar for several years with its last year being SY 07-08 before it changed to a traditional calendar for what the district described as possible budget/fiscal reasons. An evaluation report for the year-round school studied for SY 07-08 is located in Appendix E. This fact forced the researcher to use SY 07-08 as the school year for comparison of senior SOL test scores from both participating schools. Although the data from that SY may seem somewhat dated, it poses no impact on the relevance of this study, as the actual year used for test score comparison is irrelevant as long as the same year data is obtained from each of the participating high schools, and that each of the two schools used a different calendar type.

Recommendations for Future Research

With much of the research on the topic of academic calendar comparison being somewhat dated (research revealed a peak or emphasis on year-round calendar implementation and research into same having occurred in the mid to late 1990s and early 2000s), and with many previous studies producing findings that year-round schooling is academically beneficial at the elementary level in economically deprived environments, this study provided a different approach by looking at the high school level (particularly the twelfth grade) and in an area not considered to be particularly economically deprived. The results were somewhat different and partially confirmed the findings of these previous studies (Ballinger & Kneese, 2006) by indicating that the difference in academic calendar type had a significant difference on the level of student academic achievement, though specifically with regard to math and science scores. One contributing factor to the two non-significant findings may be the strong performance of the students at both schools, that no notable difference in the mean scores could be determined.

Accordingly, recommendations for further research are proposed in an effort to provide some level of redundancy which should enhance the validity of this research and to serve as possible corroboration, thereby helping to further close the gap within educational research on the topic of academic calendar comparison. Like this research, future research should focus on a comparison of year-round versus a traditional academic calendar. It should be conducted at the high school level with a preponderance of the student population studied not being eligible for the Federal free and reduced school lunch program, and with each school possessing a similar demographic composition.

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APPENDIX A: Sample Virginia Standards of Learning Test Questions**Core Content Area: History and Social Science**

1. How were the United States and the Soviet Union described after World War II?

- A. Allies
- B. Democracies
- C. Superpowers
- D. Imperialists

Core Content Area: Science

2. Which of these would be *best* to measure 12.6 mL of liquid ethanol?

- A. 25 mL beaker
- B. 25 mL volumetric flask
- C. 25 mL Erlenmeyer flask
- D. 25 mL graduated cylinder

APPENDIX B: Liberty University's Institution Review Board (IRB) Approval Letter

IRB Exemption 2022.010915: Comparing Differences of Traditional and Year-Round Academic Calendars on Student Achievement in Two Virginia High Schools

IRB, IRB [IRB@liberty.edu]

Sent: Friday, January 9, 2015 3:54 PM

To: Morin, Gregory Scott

Cc: Pearson, Constance L (School of Education); Garzon, Fernando (Ctr for Counseling & Family Studies); IRB, IRB

Attachments: MorinExemption_01_15.pdf (271 KB)[Preview on web]; ChangeinProtocol.docx (2 MB)[Preview on web]

Dear Greg,

The Liberty University Institutional Review Board has reviewed your application in accordance with the Office for Human Research Protections (OHRP) and Food and Drug Administration (FDA) regulations and finds your study to be exempt from further IRB review. This means you may begin your research with the data safeguarding methods mentioned in your approved application and no further IRB oversight is required.

Your study falls under exemption category 46.101(b)(4), which identifies specific situations in which human participants research is exempt from the policy set forth in 45 CFR 46:101(b):

(4) Research involving the collection or study of existing data, documents, records, pathological specimens, or diagnostic specimens, if these sources are publicly available or if the information is recorded by the investigator in such a manner that subjects cannot be identified, directly or through identifiers linked to the subjects.

Please retain this letter for your records. Also, if you are conducting research as part of the requirements for a master's thesis or doctoral dissertation, this approval letter should be included as an appendix to your completed thesis or dissertation.

Please note that this exemption only applies to your current research application, and any changes to your protocol must be reported to the Liberty IRB for verification of continued exemption status. You may report these changes by submitting a change in protocol form or a new application to the IRB and referencing the above IRB Exemption number.

If you have any questions about this exemption or need assistance in determining whether possible changes to your protocol would change your exemption status, please email us at irb@liberty.edu

Sincerely,

Fernando Garzon, Psy.D.

Professor, IRB Chair

Counseling

(434) 592-4054

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APPENDIX C: Data Request

DATA REQUEST

Please provide data in Comma or Character-separated value (CSV) or Excel format.

All requested data are *only* for the *last* school year that [REDACTED] [REDACTED] offered a **year-round** academic calendar (SY 2007-08)?

All requested data are to be free of any individual personal identifying information.

County/District Level Data

- 1 Total # of Schools in [REDACTED] district _____
- 2 Total # of Students attending all [REDACTED] _____
- 3 Total # of High Schools in [REDACTED] district _____
- 4 Total # of Students attending all High Schools in [REDACTED] district _____
- 5 During the *LAST* school year that [REDACTED] HS offered a Year-Round Academic Calendar to its student's, did both [REDACTED] and [REDACTED] High Schools execute the same academic curriculum in support of the Virginia Standards of Learning? _____

School Level Data

	SCHOOL LEVEL DATA FOR THE TWO PARTICIPATING HIGH SCHOOLS INDICATED TO THE RIGHT	[REDACTED] High School Year-Round Academic Calendar	[REDACTED] High School Traditional Academic Calendar
1	Total Student Population		
2	# of Students who graduated		
3	# or % of Students who were eligible for the Federal Free & Reduced Lunch Program		
4	# or % of Male Students		
5	# or % of Female Students		
6	# or % of Caucasian/White Students (Not of Hispanic Origin)		
7	# or % of Black Students (Not of Hispanic Origin)		

8	# or % of Hispanic Students		
9	# or % of Asian Students		
10	# or % of Other Ethnicity Students		
11	For how many and which School Years did [REDACTED] HS offer a Year-Round Academic Calendar to its students?		N/A
12	At [REDACTED] HS, how many Academic Calendar Days did one Year-Round School Year consist of?		N/A
13	At [REDACTED] HS, how many hours of Instructional Time did each day of the Year-Round Academic Calendar consist of?		N/A
14	At [REDACTED], how many Academic Calendar Days did one Traditional School Year consist of?	N/A	
15	At [REDACTED], how many hours of Instructional Time did each day of the Traditional Academic Calendar consist of?	N/A	

When and why did [REDACTED] High School abandon its offering of a year-round academic calendar? _____

Individual Student Level Data

The information on the below table will need to be provided for each individual senior who graduated from each of the two participating High Schools, *only* for the *last* school year that [REDACTED] HS offered a Year-Round Academic Calendar to its students.

	INDIVIDUAL STUDENT LEVEL DATA FOR EACH SENIOR WHO GRADUATED FROM ONE OF THE TWO PARTICIPATING HIGH SCHOOLS INDICATED TO THE RIGHT	[REDACTED] High School Year-Round Academic Calendar	[REDACTED] High School Traditional Academic Calendar
1	School Graduated From ([REDACTED] HS or [REDACTED] HS)		
2	# of Years (1,2,3 or 4) attended said High School		
3	# of Years Participated in Offered Year-Round Academic Calendar		N/A
4	Gender		
5	Race / Ethnicity		
6	Age at Senior Year SOL Testing		
7	Overall Virginia Standards of Learning (SOL) Test Score		
8	Math SOL Score		
9	Science SOL Score		
10	English SOL Score		
11	History/Social Science SOL Score		

APPENDIX D: Data Agreement Form



Division Research Screening Committee
Office of Program Evaluation

Data Agreement Form

Part I

This agreement is entered into by and between ██████ County Public Schools ██████, The Office of Program Evaluation (OPE) and Gregory Scott Morin.

This Data Agreement Form certifies that data, as defined in Part II of this document, are to be released from the Office of Program Evaluation to the Researcher for an established fee. It also certifies that these data are only to be used for the expressed limited activities and purposes as defined in Part III of this agreement.

The parties do hereby agree to as follows:

1. The Researcher shall comply with all federal and state statutes, as well as ██████ policies and regulations related to the use of student demographic and achievement data.
2. If the research has not been exempted, the Researcher agrees to pay the cost of the data provision, as established in Part II, prior to ██████ releasing data to the Researcher.
3. The Researcher's use of data is restricted to the activity and purposes defined in the approved research proposal (see Part III). Any other or additional use of the data may result in the immediate termination of the agreement.
4. All data provided by ██████ pursuant to this agreement is the sole property of ██████ and may not be copied or reproduced in any form or manner, and the Researcher agrees to properly destroy all data and all copies and reproduction of the data upon fulfillment of the purpose as defined in Part III of this agreement.
5. A breach of any of the provisions of the agreement will void this agreement. All data previously provided by ██████, including any copies of the data, regardless of form, will be destroyed or returned to ██████ immediately. No further data will be released to, nor agreements entered into with, the Researcher and collaborators for a period of time to be determined by ██████.
6. The terms of this agreement shall commence as of the Effective Date and shall continue for so long as Researcher retains the data, unless sooner terminated as set forth in this agreement.
7. This document constitutes the agreement in its entirety, and there shall be no deviation from the terms unless expressly agreed and executed to by the parties by way of written amendment.





**Division Research Screening Committee
Office of Program Evaluation**

Part II

This part of the agreement certifies that the following data is to be released to the Researcher by [REDACTED].

Data Description:

- The OPE will provide a document containing demographic information (number and percent) on the [REDACTED] student population in SY 2007-08 including race/ethnicity, gender, limited English proficient, special education status, and socioeconomic status. The document will also include the graduation rate based on the Virginia On-time graduation calculation.
 - The OPE will provide a de-identified student-level data file for grade 12 students in SY 2007-08 at [REDACTED] and [REDACTED] High Schools. The file will contain the demographic data listed above for each year that an EOC SOL test was taken (some variables such as socioeconomic status and English proficiency changed over time); date of birth, and number of years attending each school. The file also will contain student performance data (test name, test ID, proficiency level and code, and scale score) on the last SOL test taken in each of the following content areas:
 - Grade 11 Reading SOL,
 - Grade 11 Writing SOL,
 - Social Studies (US and VA History),
 - Science (Biology, Earth Science, or Chemistry SOL)
 - Mathematics (Algebra I, Geometry, or Algebra II SOL)
- The file should include the highest score for each SOL.

Data Format:

- A document will be provided with the division level summary data. All other data will be provided in SPSS.

Timeline for Providing Data:

- All data will be released to the researcher by March 2, 2015 or within one week of receiving funds to cover the cost of data provision, whichever is later.

Cost:

It has been determined that your request will require 13 hours of staff time at a cost of \$50 per hour. The total cost of data provision is \$650.





Division Research Screening Committee
Office of Program Evaluation

Part III

This part of the agreement certifies the following limited purposes and activities for which the Researcher may use the data sets.

The researcher may use the data provided to answer the questions posed in the research application about the effects of year-round school calendars on student performance. Specifically, the researcher may analyze de-identified achievement data from the period when [REDACTED] High School was a modified calendar school along with similar de-identified data for the same period from [REDACTED] High School to make judgments about the effects of year-round schooling on student achievement. The researcher may not use this data for purposes beyond the dissertation or resulting presentations of the data. Nor may the researcher share this data with anyone else for any purpose beyond the completion of his dissertation.

Signatures

Entered into and agreed to by the following and effective upon whichever signatory date is the latter.

FOR [REDACTED] COUNTY PUBLIC SCHOOLS:

[REDACTED]

3/27/2015

Date

FOR THE RESEARCHER:

[REDACTED]

Gregory Scott Morin
Doctoral Candidate
Liberty University

March 4, 2015

Date



APPENDIX E: Evaluation Report

Evaluation Report for Schools Operating Experimental, Innovative, or Year-Round Programs: 2006-2007

I. Please provide the following background information.

- A. Name of school [REDACTED]
- B. Name of school division [REDACTED]
- C. In what year was the program first approved by the state Board of Education? 2007
- D. What grades are served in this program? Pre-Kindergarten Kindergarten Grade 1
Grade 2 Grade 3 Grade 4 Grade 5 Grade 6 Grade 7 Grade 8
Grade 9 Grade 10 Grade 11 Grade 12
- E. Is this a Title I school? Yes No
- F. What was the total number of students attending this school in 2006-2007? 1520
- G. Describe the innovative/year-round program and its focus areas.
The modified school calendar at [REDACTED] is designed to provide all students with the time they need to succeed academically. The 8-week summer trimester allows students to complete up to four additional semester courses, continue with courses not yet mastered, or complete two year-long courses. For students to complete the summer trimester and take the SOL tests, it is necessary to begin the summer trimester mid-June and shift the beginning of the fall semester to mid-August.
- H. List the school's program goals and program outcomes for the 2006-2007 school year.
The goals of the MSC at [REDACTED] are: To provide all students the time they need to succeed academically, to create more seamless opportunities to build on students' learning during the fall and spring semesters, to capitalize on the continuity of learning for language minority students, and to offer selected courses to groups of high-risk students over three semesters to give them more opportunities for practice and learning.

II. Student Achievement

- A. Has this school been able to achieve or maintain full accreditation? If no, please explain the steps taken to do so. Yes No

Has this school been able to meet the requirements for Adequate Yearly Progress (AYP)? If no, please explain the steps taken to do so. Yes No
- B. How many students in this school participated in the innovative/year-round program? 1520
- C. What percentage of the students participated in academic remediation during the 2006-2007 school year? 30%

Has this additional academic support facilitated overall academic improvement for the students participating in the remediation program? Are demonstrated results available through test scores or other quantitative information? Yes No
Shortly after the inception of the summer program, ASAP Program, and year round tutoring, Ds and Fs dropped in half and have remained at that low point since that time.
- D. Are the students participating in this program better prepared for the next grade? Has improvement been evidenced since this program was established? Yes No

SOL data over the past 8 years indicate that the longer students attend ██████ High School, the better they perform academically. LEP students participating in summer sessions show gains in literacy skills and progress more rapidly through the ESOL program. The school has a stated goal that all students will read at grade level within 1000 days of entering. Data from annual reading assessments indicate that only a handful of students, most special education students, fail to reach that goal.

- E. What percentage of the students in this school was retained in grade during the 2006-2007 school year? 5%

How has that percentage changed since the school became an innovative/year-round program?

Yes (changed) No (did not change)

In the past three years, Stuart has reduced the ninth grade retention rate from a Virginia state average of 13-14 percent to 5 percent.

- F. Out of the total student population, what percentage of the following subgroups participated in the year-round program?

White 26.4%

African-American 11.7%

Hispanic 39.5%

Economically disadvantaged 50.8%

Limited English proficient 20.6%

Students with disabilities 14.2%

Has there been an improvement in academic achievement in each of these subgroups since the school initially received this waiver? Please explain. Yes No

ESOL students have improved their reading/writing scores. In many cases, the students have been tested and were able to advance to the next level. The students are remediated and because they attend year round, they do not lose any of their learned skills. Many students attend the summer session to repeat a failed class, to catch up on graduation requirements or to take a required class to leave room for an elective during the regular school year.

- G. Do this school's 2006-2007 Standards of Learning (SOL) test results show an Achievement Gap? Where does the Achievement GAP exist? Please explain. Yes No

Do the 2006-2007 SOL testing results show that the Achievement Gap has narrowed? If these SOL testing results continue to show an Achievement Gap, how does the school plan to resolve this issue? Yes No

III. Student Behavior and Attendance

- A. What was the overall student attendance rate for 2006-2007? 95.0%

Has there been any overall change in student attendance since this program was approved? If Yes, how has this program impacted student attendance? Yes No

The student attendance rate at ██████ High School has increased from 89 percent since adopting the modified calendar. The increase in the attendance rate has had a positive impact on SOL scores, reading scores and student grades.

- B. Has there been any overall change in the number of student disciplinary actions since this program was approved? If Yes, please explain. Yes No

Due to the improvement in attendance since adopting the modified calendar, we have seen a dramatic improvement in student achievement across the board and student disciplinary actions have dramatically decreased. This provides further evidence that student achievement and student disciplinary actions are inversely related.

IV. School Staff/Teacher Support

- A. How has school staff/teacher support or lack of support impacted the program? Please explain.
The [redacted] staff has fully embraced the modified school calendar. Summer sessions are staffed entirely by [redacted] teachers.

V. Parent/Community Support

- A. Does the program have the support of parents and the community? How was this determined?
 Yes No
The School Division offers parents the choice of transferring their child to a traditional calendar school. Only a handful of families take advantage of that offer. In fact, in the past year, only two students placed out of [redacted] for that reason, while many, many more requested placement at [redacted].
- B. Are parents and the community satisfied with the program? How was this determined?
 Yes No
The School Division offers parents the choice of transferring their child to a traditional calendar school. Only a handful of families take advantage of that offer. In fact, in the past year, only two students placed out of [redacted] for that reason, while many, many more requested placement at [redacted].

VI. Recommendations and Goals

- A. Describe your program goals for the 2007-2008 school year.
Recommendations-Professional Learning Community (PLC)-Incorporate weekly PLC meetings into the school bell schedule, IBMYP-Train students, faculty and staff on the IBMYP program, implement a plan to incorporate IBMYP into daily classroom instruction and assessments, continue to expand the number of participants in the AVID program, and use after-school instruction and tutoring (ASAP) to further expand literacy program.
- B. Have your program goals for 2007-2008 changed from the prior year in response to outcomes for the 2006-2007 school year? If yes, please explain why the goals have changed. Yes No