

YEAR-ROUND CALENDARS AT THE HIGH SCHOOL LEVEL

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STATEMENT BY AUTHOR

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The purpose of this paper is to explore the effects of a year round calendar on math scores at the high school level. Students forget facts, especially math facts, over long extended breaks. Year round calendars aim to address this dilemma by minimizing long breaks from learning.

The results of year round calendars have been mixed. Some schools have reported both academic and monetary gains after switching from a traditional calendar, while other schools have seen modest gains in student learning. All studies cited in this paper report that at-risk and low socioeconomic students benefit academically from a year round calendar. Since no studies in this paper have shown that year round calendars hurt students academically and all show that they help at-risk students, the change from a traditional calendar to a year round calendar should be explored by schools.

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## Chapter 1: Introduction

Summer vacations are a tradition for students, parents and teachers across the country. Research shows that students lose information over the summer break (Kerry & Davies, 1998). This loss is even more pronounced in mathematics (Cooper, 2003). With this information in mind, schools must look at whether the academic calendar is contributing to this loss. Year-round calendars are a way for schools to distribute the summer vacation throughout the school year. Since student learning is the primary focus of schools, this research paper will investigate the effect of year-round calendars on standardized test scores, focusing on mathematics, at the high school level.

### *Statement of the Problem*

School calendars are based on tradition and not on how students learn. The current calendar schools use has been around for over 100 years and is based on an agrarian system where children went to school during the winter and spring and worked on the family farm during the growing season (Kerry & Davies, 1998; “School Days”, 2006). Currently, only 3% of American livelihoods are tied to the agricultural cycle (Cooper, 2003); however, the school calendar has not evolved with this shift. Instead, students, families and teachers have come to rely on summer vacations as a break from learning. Because students often forget the previous year’s knowledge, summer vacations are not necessarily conducive to student learning (Kerry & Davies, 1998). Students from less advantaged families

have an even more pronounced loss (Shields & Oberg, 1999). According to Ron Fairchild, executive director of Johns Hopkins Center for Summer Learning, “Summer is a time when affluent kids advance and low-income kids suffer huge setbacks. If kids aren’t engaged in ongoing learning activities, they lose ground academically” (as cited in “Notes on calendars”). McGavin (1997) states that schools spend several weeks bringing students back up to speed after vacations.

\_\_\_\_ If our current school calendar is out of date and hurts student learning, then is there a better way to even out schooling and vacations? This research paper will look at several elementary, middle and high schools that are currently on year-round calendars and the results they have seen. After this analysis, a determination will be made if a year-round calendar is a good fit for the high school where the author currently teaches. According to the Minnesota Department of Education (2010), this 9<sup>th</sup> through 12<sup>th</sup> grade high school has a student population of 783, 97% of whom are white. This school has 7% special education, 15% free and reduced lunch, and 0% limited English proficient students (Minnesota Department of Education, 2010). In 2009, the percent of students at this high school passing the grade 11 Minnesota Comprehensive Assessment in mathematics exceeded the state average by 23%.

### *Research Questions*

How did our current school calendar develop?

What are the different options for school calendars in the United States?

How do year-round calendars and traditional calendars differ?

How are year-round calendars and traditional calendars similar?

Why do schools choose year-round calendars?

How might a year-round calendar affect teachers and students in a high school in suburban Minneapolis, Minnesota?

Does a year-round calendar improve student learning?

### *Significance of the Research Problem*

Learning is not a linear process; when a student is taught a piece of information, he or she does not automatically remember it. Instead, most curriculums develop as a spiral: topics are taught multiple times and in multiple ways, progressing each time they are brought up. Jerome Bruner studied this form of learning more than 50 years ago, stating that students learn best when the basic ideas are revisited each year but with progressive intensity and difficulty (Smith, 2002). One reason for spiraling a curriculum is that students naturally forget some of the information they learn, so it is beneficial to review and re-teach subjects. When a person hears or is told a piece of information, it must be solidified as a memory in the brain before it is formed as part of the person's knowledge, and memories are very vulnerable during this consolidation period (Wixstead, 2005). The question that school districts must ask is whether our current September through May calendar makes this learning loss worse and forces teachers and students to spend even more time on review. For some students, summer breaks have no effect, but for others, depending on family dynamics and many other factors, summer break can be extremely detrimental to

their learning. Studies have shown that summer vacation is a major contributor to learning loss (Kerry & Davies, 1998; Cooper, 2003), and districts need to research various types of calendars to determine what is best for students and teachers.

The school calendar should be shaped around what is best for student learning. At the conclusion of this research, it will be suggested what type of calendar is best for a suburban Minneapolis high school. The answers to questions about school calendars are essential for the improvement of student learning.

#### *Limitations and Assumptions*

The research in this paper will be limited to schools that are currently on a year round calendar. The research will focus on mathematics at the high school level but middle and elementary levels will also be considered as well as other content areas.

One of the assumptions of this paper is that improvement on standardized test scores is an improvement in student learning. Also, when there is a difference in standardized test scores between traditional and year-round calendars, the difference in scores is due, in part, to year-round schooling. Finally, the major assumption of this paper is that schools will base their decision on year-round calendars on academic value, not on other factors such as the cost of adding air conditioning to schools, community disagreement, or union issues.

*Definition of Terms*

**45-15 calendar:** a year-round calendar in which students go to school for 45 days and then have a 15 day break. The school year is divided into four quarters.

**At-risk student:** a student at-risk of failure due to low socioeconomic status or some other factors s outside of the classroom.

**Traditional calendar:** a nine-month school calendar with a three month summer vacation. Students typically attend school for about 180 days during the nine months of school.

**Year-round calendar:** a nontraditional school calendar which replaces the long summer break with several smaller breaks throughout the school year. The number of school days remains the same.

*Summary Statement*

The current school calendar has been around for over 100 years and has evolved to include a summer vacation of about three months. Shulte (2009) found that taking an extended break from school is not beneficial to student learning, with math skills especially suffering over the summer break. This paper will look at research to determine if there is an alternative to the traditional summer break. Year-round calendars distribute the summer vacation throughout the year, providing students with a more even flow of learning. Knowing if year-round calendars improve student learning will provide schools with evidence that a change is beneficial.

## Chapter 2: Review of the Literature

While students, parents and teachers across the country look forward to summer vacation, there are major consequences to this extended break. Research shows that students lose information over the summer break (Kerry & Davies, 1998), particularly in mathematics (Cooper, 2003). This paper will examine the positive and negatives aspects of a year round school calendar, especially on the mathematics curriculum in a small suburban school district in Minneapolis, Minnesota. With this information in mind, schools must look at whether the calendar is contributing to this loss.

When the traditional school calendar was developed, student learning was not a priority. Because many children were needed to work on family farms during the growing season, school was held during the winter and spring. The current calendar schools use has been around for over 100 years (Kerry & Davies, 1998; “School Days”, 2006). Presently, only 3% of American livelihoods are tied to the agricultural cycle (Cooper, 2003); however, the school calendar has not evolved with this shift. Instead, students, families and teachers have come to rely on summer vacations as a break from learning.

Schools’ calendars are also controlled by state legislatures. Most states have a set number of days students are required to go to school. One hundred eighty days of school is the number required by 34 states (“School Days”, 2006). While some states allow school districts to distribute those dates as they choose, with either an extended summer vacation or several shorter vacations throughout the year, Minnesota prohibits schools from starting the school year before Labor Day (“School Days”, 2006). This mandated start date discourages school districts from exploring alternative school calendars that

would require flexibility in school year start dates. Summer vacation is ingrained not only into family and social traditions but also into legislative mandates.

Because students often forget the previous year's knowledge, summer vacations are not necessarily conducive to student learning (Kerry & Davies, 1998). Cooper (2003) found student test scores were lower in the fall after a return from summer vacation than they had been in the previous spring. McGavin (1997) states that schools spend several weeks bringing students back up to speed after long summer vacations. Another alarming concern is that summer learning loss seems to worsen as students get older (Kerry & Davies, 1998). A year round calendar distributes the long summer vacation into shorter breaks with the idea that students will have less time to forget information. If our current school calendar is out of date and hurts student learning, then is there a better way to even out schooling and vacations?

The extent of summer learning loss varies among different academic subjects. Mathematics learning is affected more by the break than reading and spelling (Kerry & Davies, 1998; Cooper, 2003). One reason for this could be that students read over the summer but very few do mathematics. Ferguson (1999) found there is a significant amount of forgetting in mathematics over the summer. Without practice, procedural math skills are forgotten (Cooper, 2003). No matter how much ground is gained academically during the school year, three months off with no practice affects students' learning. Capps and Cox stated that the traditional school calendar is a contributing factor to low achievement in mathematics (as cited in Ferguson, 1999).

While all students lose ground academically, students from less advantaged families have an even more pronounced loss (Shields & Oberg, 1999). According to

Shulte's research (2009), mathematical skills for students of all backgrounds slip over the summer. However, summer slippage was particularly noticeable among at-risk students due to a lack of home and community reinforcement of academic skills over the long break (Ferguson, 1999; Kerry & Davies, 1998).

Summers for students of diverse backgrounds can vary in many ways. Ron Fairchild, executive director of Johns Hopkins Center for Summer Learning, asserts that low-income students experience learning loss during the summer, while students from higher socio-economic classes actually advance. The reason for this has to do with the varying experiences of these students during the summer ("Notes on calendars", 2008).

The U.S. Census reports that 71 percent of women with children work outside the home (Shulte, 2009). In a middle class household, often a two-parent family, this does not have as much of an effect on the child's learning loss because he or she is often involved in summer camps and other activities that engage the mind. Many low income and at-risk students are raised in single-parent households. When that one parent works in the summer, the child is often left alone, resorting to television or video games as babysitters (Shulte, 2009). This partially explains why low-income and at-risk students experience a larger amount of summer learning loss.

It has been established that students lose knowledge over the summer, especially low-income and at-risk students. One possible solution to this problem is the elimination of the extended summer vacation by adjusting the school calendar. There are two main ways to accomplish this goal. One way would be to extend the school year into the summer and start the following school year sooner by adding days to the school calendar. For many reasons, including opposition from teachers' unions, parents and the business

community built around summer vacations, in addition to the current economic climate, adding school days to the calendar does not seem feasible. The other option is to adjust the vacations that already exist in the current school calendar, including summer, so they are spread out more evenly throughout the year. This type of calendar would be divided into four quarters of 45 school days which would each be followed by a 15 day break. Students would still go to school for approximately 180 days a year; the days at schools and the days away would simply be adjusted. This paper is going to focus on the second type of year round calendar, in which no extra days are added. Many schools that have seen improvement after changing to a year round calendar also added school days. This paper will look at schools that have adopted a year round calendar without adding school days, examining if that modification alone has improved student learning.

Year round calendars are not a new concept, and increasing academic achievement has not always been the motivation behind the change. Prince William County, Virginia adopted a year round calendar to accommodate more students in 1978 (Evans, 1978). Students were put in groups and on different calendar cycles. While one group of students was starting their three-week break, another was just starting their academic days. Constant flow of students in and out of the school allowed for the same sized school to accommodate more students. In 1992, overcrowding was the reason eight high schools in California adopted year round calendars (Webster & Nyberg, 1992).

Another reason some school districts adopt a year round calendar is cost savings. Most schools sit empty for three months. Even accounting for the cost of adding air conditioning and other expenses to current schools, it makes sense to keep these buildings open and running year round. America has invested a quarter of a trillion dollars into

school buildings (Bradford, 1996) and it seems illogical to not use them to their full extent.

The most important reason to adopt a year round calendar is for academics. David Mussatti conducted research on year round education in California and nationwide. He states that motivation for year round calendars should be to improve education (1981). Since at-risk students are most adversely affected by long summer breaks, it stands to reason they would benefit most from a year round calendar. In the late 1980s, schools began to develop year round calendars to address the needs of at-risk students and this trend continues to this day (Cook, 2005).

There are many reasons to adopt a year round calendar. It addresses many problems that face our current school system including overcrowding, cost savings, and low academic achievement for at-risk students. With such obvious reasons to switch, why have so few schools changed? The answer is in the results. Some studies have found mixed results as to the true benefits of year round calendars (Dossett & Munoz, 2000). With no guarantee that a year round calendar will be beneficial, most schools are not willing to take the leap. This section will look at all the results, both positive and negative, and try to find the reasons behind the successes or failures. With this knowledge it can be determined if a year round calendar will work in a suburban Minneapolis high school.

At its root, a year round calendar would save money for a district. Since the building is in constant use, a school of the same size can accommodate more students. This makes the physical building more cost effective. Another way a school saves money is by intervening with failing students sooner. Since classes start over more often,

a student who fails a course can retake the class in the next semester instead of continuing for an entire year before restarting (Bradford, 1996). The cost savings appears as these students finish school faster. On the other hand, there are some costs associated with year round calendars. Up front costs include upgrading buildings with air conditioning. Since buildings are never empty, maintenance work that is normally done in the summer must be done at other times (Webster & Nyberg, 1992). There is a cost associated with maintenance being done after different times or not as often. There are arguments on both sides of the cost of year round calendars. So what do the schools that are currently on year round calendars say? The results are mixed. While Bradford claims after a 20-year follow up study there was a financial savings to taxpayers (1996), Shulte states that year round calendars cost more (2009). Bradford found that the Buena Vista City Public Schools saved about \$130,000 on a year round calendar. These savings were calculated by looking at the cost associated with failing students. Students who needed to repeat failed class could be identified and start over sooner on a year round calendar rather than waiting a full year on a traditional calendar. This saved the district the cost of remedial classes and repetition of full classes (1996). On the other hand, in Shulte's study, Virginia Beach Public Schools estimated that changing back to a traditional calendar at four elementary schools would save \$792,000. It should be noted that a district spokesperson mentioned the effectiveness of the year round calendar and the stated the change back to a traditional calendar was strictly based on budget concerns (2009).

Either way, Mussatti says that cost is a moot point. Motivation for year round calendars should be to improve educational programs and not to save money (1981). For this paper, cost should not be the most important criteria when looking at the benefits of year

round calendars. Education costs money and there is no way around that. If year round calendars improve education for students, that should be the primary factor to consider.

A year round calendar changes how a school is run. With no true beginning or end, the normal rhythm of the school year is changed (Webster & Nyberg, 1992). Course offerings will change. Evans found that there were more course offerings at a traditional high school verses a high school on a year round calendar (1978). Advanced placement courses were especially limited (Webster & Nyberg, 1992). Extra curricular activities will need to be run differently. Sports seasons and practices will span the shorter breaks. However, studies have found year round calendars had no effect on extra curricular participation (Bradford, 1996: Shields & Oberg, 1999: Evans, 1978). Students who are motivated enough to join a sport or club outside of the school day are also motivated enough to keep participating even when on break (Webster & Nyberg, 1992). There is a belief that year round calendars will have a negative impact on job opportunities for high school students, but Shields & Oberg found this to not be true (1999). In fact, they found that there were more available jobs since students had time to work throughout the year. After a year of experiencing a year round calendar, most students and teachers had positive attitudes about it (Shields & Oberg, 1999: Cooper, 2003).

In contrast, year round calendars have experienced some backlash, like any progressive idea. “Save Our Summers” is a parent-led group opposing year round calendars. This organization believes that schools are not giving families enough credit for teaching and working with children outside of school hours (Cook, 2005). This group is predominantly made up of socially conservative families with middle to upper middle class incomes. The families are mostly white with one parent who does not work and

children who are already performing well in school (Cook, 2005). Other groups also oppose year round calendars. The tourism industry wants later start dates, even lobbying for summer breaks that do not end until Labor Day. This opposition is often backed by the International Association of Amusement Parks and Attractions (Shulte, 2009). These negative views are not based on academics. Both groups oppose year round calendars for personal reasons. If the facts show students learn better on year round calendars, then that position needs to be clearly communicated.

With feelings for and against year round calendars very strong, it is important to look at the actual results that schools have seen while on a year round calendar. This is more difficult than it sounds. Unbiased research is difficult to identify. Proponents of year round calendars say that longer summer vacations take a toll on learning, especially among economically disadvantaged and minority students, while opponents say benefits of year round calendars are modest at best and not cost effective for schools or families (Cook, 2005).

Year round calendars can improve learning for students. Socioeconomically disadvantaged and poor achieving students have found success on a year round calendar (Shields & Oberg, 1999; Stenvall & Stenvall, 2001; Cooper, 2003; Cook, 2005).

Cooper's study looked at schools in California on both traditional and year round calendars. He found that limited English proficient students and students on free and reduced lunch on a year round calendar performed exceptionally well compared to the same demographic of students on a traditional calendar at the high school level (2003). Shields and Oberg conducted a study of middle school students in urban Utah and found that when socioeconomic status was taken into consideration, the success of year round

education compared to a traditional school year was overwhelmingly positive(1999).

These students are academically more successful on a year round calendar with no summer break to lose gains.

There is no doubt that economically disadvantaged and minority students benefit from year round calendars. So how do other students fair on year round calendars? Cook found that the difference in performance of white children was positive on a year round calendar but not by a significant amount (2005). Kerry and Davies argue that, in terms of learning, year round calendars help disadvantaged students and are not detrimental to any students (1998). In other words, year round calendars help a portion of students who are already struggling and they do not hurt those students who are doing well.

The effect of year round calendars on mathematics can be measured in two different ways, in the classroom and on standardized test scores. First, studies show that math learning does improve on a year round calendar for some students. Mathematics and reading achievement for all students was better on a year round calendar, especially for at-risk students (Kerry & Davies, 1998). Second, student growth in mathematical learning can be determined by looking at standardized test scores. In Minnesota, standardized test scores are used to measure schools. An overall improvement in standardized test scores documents an improvement in mathematical learning. Shields and Oberg found that standardized test scores are as good or better on a year round calendar (1999). Shulte measured standardized test scores during a three year study and found that students on a year round calendar scored better (2009). Bradford studied Buena Vista High School in Virginia, which was on a year round calendar for 20 years, and found that standardized test scores improved (1996). Shields and Oberg, Shulte and

Bradford have all found that standardized test scores and thus math scores improve on a year round calendar.

Not all results have been positive for year round calendars. In the late 1970s, many schools adopted year round calendars to accommodate more students in overcrowded schools. These early adaptations did not have a favorable result academically. Evans reported no difference in academics or SAT scores between year round and traditional calendars (1978). Similarly, Mussatti found that student growth was essentially the same between year round and traditional academic calendars (1981).

These results are not isolated to just early adaptations. In 1999, Ferguson found no significant difference between year round and traditional calendars. Dossett and Munoz, also, found that year round calendars did not have a significant impact on cognitive learning (2000). Winter cites a substantial body of work that indicates there are no significant differences in achievement between students on a year round calendar and those on a traditional calendar (2005).

Looking at only test scores as an indicator of learning might be misleading. Kerry and Davies argue that learning is a continuous process and interruptions can hinder students' progress (1998). Ferguson posits students on a traditional calendar had lower test scores in the spring as a possible result of burnout (1999). Since year round calendars shorten long breaks and provide more frequent breaks, it may stand to reason that students experience less burnout. Teachers who taught on a year round calendar reported students with less fatigue and more on-task behavior (Ferguson, 1999). These characteristics may lead to improved long term learning. A study of two groups of 6<sup>th</sup> grade gifted and talented students taking a pre-algebra course, one on a traditional

calendar and one on a year round calendar, found some interesting results. On the traditional calendar, test scores peaked at the midway point and then faded by spring, while the test scores on a year round calendar slowly gained throughout the year (Ritter, 1992). Since the scores on the year round calendar steadily improved throughout the year, they might indicate a more consistent learning process.

In addition to having students with less fatigue, year round calendars provide teachers and schools with an opportunity to systematically improve student learning. Shulte found that almost 90% of students maintained reading and math skill levels over a shorter summer break (2009). With students coming back from break with less loss, teachers can move forward more quickly. Teachers report spending less time reviewing material on a year round calendar (Shields & Oberg, 1999). As a result, more learning can take place.

Year round calendars give schools a structure that can improve student learning. Since classes start and end more often, students who are at-risk of failure can receive the intervention they need sooner. Students can be placed in the right class after nine weeks instead of waiting until halfway through the school year or waiting until the end of the school year under a traditional calendar. With classes starting and ending every nine weeks, year round calendars also allow teachers to implement new teaching strategies more frequently (Shulte, 2009). When a teacher on a traditional calendar wants to change a lesson, they must wait an entire year to make the change. Conversely, a teacher on a year round calendar will be able to make the change in nine weeks. With this constant improvement, student learning improves.

Year round calendars are not a panacea. The use of time in a year round calendar explains only part of student achievement (Dossett & Munoz, 1999). Success boils down to not just adjusting the time in the classroom but how teachers, schools and students use the time (Shulte, 2009). The success of year round calendars is determined by changes in teaching and the learning environment (Shields & Oberg, 1999). This means that switching to a year round calendar alone will not bring positive results. Schools, teachers, parents, students and the community must all work together to bring about positive change in education.

### Chapter 3: Discussion

The purpose of this paper is to explore the effects of a year round calendar on math scores at the high school level. Students forget facts, especially math facts, over long extended breaks. Year round calendars aim to address this dilemma by minimizing long breaks from learning.

The results of year round calendars have been mixed. Some schools have reported both academic and monetary gains after switching from a traditional calendar, while other schools have seen modest gains in student learning. All studies cited in this paper report that at-risk and low socioeconomic students benefit academically from a year round calendar. Since no studies in this paper have shown that year round calendars hurt students academically and all show that they help at-risk students, the change from a traditional calendar to a year round calendar should be explored by schools.

Success under a year round calendar is determined by many factors. Some schools would benefit greatly by switching from a traditional calendar while other schools would not see as much change. The school where I teach is in a suburban area. It has a student population of 783 very homogeneous students; 97 percent are white and one percent each are Asian, black and Hispanic (Minnesota Department of Education, 2010). This student population also has a small percentage of low socioeconomic and at-risk students. Only seven percent of the students are special education, fifteen percent are on free and reduced lunch and no students are limited English proficient (Minnesota Department of Education, 2010). Since students of low socioeconomic status and at-risk students benefit most from year round calendars, it stands to reason that my school would not see great academic increases by changing from a traditional calendar.

The school where I teach currently is very successful in mathematics. Students taking the Minnesota Comprehensive Assessment II (MCA II) math test in grade 11 at this school have scored well above the state average. In 2009, 68 percent of the students taking the test passed versus just 42 percent statewide (Minnesota Department of Education, 2010). In 2010, 66 percent of the students at this school met or exceeded the state standards while only 43 percent met or exceeded statewide (Minnesota Department of Education, 2010). While 68 percent and 66 percent passing rates still allow room for improvement, one cannot ignore the state average of only 42 percent and 43 percent of students passing. [This school already scores well above the state average.](#) In this sense, it is difficult to improve the passing rate, and this school would not see great changes in math scores on a year round calendar. Moreover, in 2010, 90% of students passed the MCA II after remediation within three attempts. If one of the goals of year round calendars is to improve math test scores, it will be difficult to improve on 90% of students currently passing the MCA II.

The final factor that determines the success of a year round calendar is community support. This community is very conservative and fairly wealthy. They oppose change in many forms and are comfortable with the status quo. The combination of these two factors suggests the community is less willing to embrace a year round calendar. Groups like Save Our Summers and Summer Matters would find many supporters in this community. The change to a year round calendar must be supported by many different groups within a community. In the community where I teach, it would be challenging to find enough support to begin the process of changing to a year round calendar.

Many schools have seen a positive change after switching to a year round calendar, while other schools have experienced mixed results. Schools should explore year round schools on an individual basis. In the school where I teach, the change to a year round calendar would have a low chance for success for three reasons. First, studies have shown that the students who benefit the most from a year round calendar are students with low socioeconomic status and this school has very few students from that population. Second, high school mathematics test scores at this school are already well above the state average. It is hard to justify a change to a year round calendar when no change seems necessary. Finally, the community is resistant to **change** and would be unlikely to accept such a fundamental shift not only to the school system but also to their family lives. All these factors add up to an uphill battle that may not produce enough positive results to justify the fight. While some schools would benefit from the change to a year round calendar, I do not recommend it in the school where I teach.

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