EFFECTIVENESS OF THE FOUR DAY SCHOOL WEEK ON END OF COURSE EXAM SCORES IN BOTH COMMUNICATION ARTS AND MATH

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ABSTRACT

The purpose of this study was to determine if there is a difference in student achievement of students that attended school in the traditional five-day school week as compared to those students that attend school using a four-day school week format. After the 2009-2010 school year a rural school district in the Midwest United States instituted a four-year school calendar in order to reduce operating costs of the district. One of the tools that would be used to evaluate the new schedule and determine its value was student achievement on EOC exams. If it was found that student achievement on these exams had decreased after the adoption of the four-day school week, the district would more than likely re-evaluate their decision to change the schedule and might transition back to the traditional five-day format. This study compares student scores on the Algebra I and English II EOC exams from a four year period; two years prior to the institution of the four-day school week and the two years following the adoption. After conducting a t-test analysis of student scores on these two tests over the four year period it was determined that there was no significant difference in student achievement on these two exams. Students performed nearly the same on required accumulative state exams while using the four-day school week calendar as they did while going to school using the five-day school week model. There is limited research that supports the findings of this study but as more studies are conducted and more districts begin adopting the four-day school week, we will begin to determine the validity of the four-day school week in terms of student achievement and performance.
INTRODUCTION

Background, issues and concerns.

After the 2009-2010 school year the school district decided that they were going to change their school calendar and begin having school only four days a week instead of the traditional five days. Much research was conducted by the school district and even more thought was put into the planning for this schedule change. One of the concerns that the school district had in making this transition was the effect that it might have on student achievement and especially on state standardized testing.

The Missouri End Of Course (EOC) Exam is one of the major tools in the evaluation of public schools in the state of Missouri. The Missouri Assessment Program assesses students’ progress toward mastery of the Show-Me Standards which are the educational standards in Missouri. The Missouri Assessment Program currently requires End-of-Course assessments in the subject areas of Algebra I, Biology, English II and Government. End-of-Course assessments are taken when a student has received instruction on the course-level expectations for an assessment, regardless of their grade level.

Since the four day school week is more of a non-traditional school schedule there is need for research that proves its effectiveness. The change to a four day school does provide opportunities for budget reliefs and extra-curricular activities however there is not yet enough evidence to prove its effectiveness in the classroom. For decades State Departments of Education have been using state standardized testing in order to determine the effectiveness and achievement of individual schools and school districts. In order to determine the effectiveness of the four day school week at the high school in the school district this research project will compare exam scores of students from the Algebra I EOC and the English II EOC. Scores from four separate years will be examined: two school years prior to the schedule change (2008-2010)
and two years after the initiation of the four day school week (2010-2012). We will use the raw scores of these examinations in order to determine the effectiveness of each schedule.

Practise under investigation.

This research will evaluate student scores on state EOC exams two years prior to the initiation of the four day school week and two years after the initiation of the four day school week in the district. Since the four day school week is more of a non-traditional approach to school scheduling, it is important to constantly evaluate it for effectiveness. The results of the research will evaluate the effectiveness of the four day school week or the five day school week when it comes to student achievement on state EOC exams. The research will not evaluate individual teacher instruction or any other factors but results on these exams. The results will shed some light on the value of the four day school week.

School policy to be informed by study.

In this research project the school policy that is being evaluated is the school schedule. After the 2009-2010 school year the school district’s school board and its administrators decided to change their school calendar to the four day school week format. The state of Missouri allows each individual school district the ability to adjust their schedule as long as they complete the required amount of school hours or the required amount of school days. Since there is some flexibility in how a school can organize their schedule, it is important for schools to constantly evaluate their scheduling decisions. The research conducted through this project will provide a tool for the school district to evaluate its policy when it comes to its four day school week.
**Conceptual underpinning.**

One of the primary concerns surrounding the implementation of the four-day school week is the impact that the change would have on student learning and achievement. Critics against the non-traditional school calendar worry that the reduced number of instructional days will have a negative effect on student learning. Few studies have been conducted to document the impact of the four-day week on student achievement. This leads researchers to argue that because the four-day school week is typically implemented in small, rural districts, the data collected has simply been too limited to effectively evaluate the impact. Much of the literature on the practice of the four-day school week concludes that a shortened schedule may have a positive effect, and in most cases has no negative impact. Some of the key studies in the field are described below.

In a study conducted using achievement data from five rural Colorado school districts before and after implementation of a four-day week calendar, researchers examined scores across the same group of students for four years, and across the same grade level for the same period. They found that the change in schedule had “no discernable impact on test performance” (Daly & Richburg, 1994, p. 1).

In a study of four-day school calendars in New Mexico researchers were able to demonstrate that not only did student achievement not suffer as a result of the change in calendar, in some districts it actually improved. The same study determined that student performance on standardized tests remained above state and national averages (Koki, 2002). Yarborough (2006) was able to report similar findings in Webster, KY, which switched to a four-day week in 2003. Reinke’s (1997) summary of annual reports which was delivered to the Oregon State Department of Education by districts using the four-day school week was also able
to document maintenance or slight improvement in student achievement during the period after implementation of the shortened calendar.

Finally, Feaster (2002) examined achievement data in Custer, SD over a ten-year period and found that fourth and eighth grade students in the district continued to exceed the state average after the implementation of a four-day week calendar. The same study found that achievement levels among all district students did not significantly change with the implementation of the revised schedule.

Statement of the problem.

Since the transition from the traditional five day school week to the four day school week two years ago, the school district has been in the process of continually evaluating its decision for effectiveness and efficiency. One of the major tools of evaluation for public schools in the state of Missouri are student EOC exam scores. In order to effectively evaluate the four day school week it would be imperative to be sure and look at student scores on these exams. A drop in achievement might justify a re-evaluation of the four day school week. An increase in achievement on these exams would vindicate the change of the four day school week. The scores on these EOC exams will increase, decrease, or stay the same on a year to year basis. No matter the result of the comparison the effectiveness of the four day school week as compared to the traditional five day school week will be determined.

Purpose of the study.

The purpose of this research project is to determine the effectiveness of the four day school week in the school district in terms of student achievement on the state EOC exams.
Student scores will be evaluated from the previous four years. Two of these years (08-09 & 09-10) the school was organized in the traditional five day school week. The other two years (10-11 & 11-12) the school used the non-traditional four day school week. The purpose of this research is to compare these two sets of data in order to determine which of the school schedules is more effective in terms of student achievement.

Research questions.

- RQ#1: Is there a difference between student scores on state EOC Math and EOC Communication Arts exams in the four day school week as compared to that of the traditional five day school week?

Null hypothesis.

The null hypothesis for this research project is that there is no difference between student scores on state EOC Math and EOC Communication Arts exams in the four day school week compared to that of the traditional five day school week.

Anticipated benefits of the study.

Scores on the EOC exams will increase, decrease, or stay the same. If it is determined that student scores on EOC exams in the past two years have dropped, there will be evidence that suggests that the four day school week might be ineffective and the district may need to re-evaluate their current schedule. If it is determined that student scores on EOC exams in the past two years have risen, there will be evidence that the four day school week has been effective and the district will continue using the current schedule. If it is determined that there is no difference in student scores on EOC exams prior to the initiation of the four day school week in the 2010-
2011 school year and scores after the introduction of the four day school week, it will be evident that the length of school week has no effect on student achievement on state EOC exams. Based on the results of this research the school district will have a better understanding of the effectiveness of the four day school week as compared to the five day school week when it comes to student achievement on EOC exam scores. From there they can begin to assess whether to go forward with the current schedule or return back to the traditional five day school week.

**Definition of terms.**

- **Algebra I EOC Exam** – students enrolled in Algebra I courses are required to take the End of Course exam in that course. The test is a 35 question multiple choice exam and there is no time limit on the test. Scores are given a raw score, which is the number of questions that students answer correctly, and a scale score in which questions are given different values. After the score is collected students are placed into a category of either advanced, proficient, basic, and below basic. Schools are evaluated based on their raw scores, their scale scores, and the number of students that qualify for each level.

- **English II EOC Exam** – students enrolled in English II courses are required to take the End of Course exam in that course. The test is a 35 question multiple choice exam and there is no time limit on the test. Scores are given a raw score, which is the number of questions that students answer correctly, and a scale score in which questions are given different values. After the score is collected students are placed into a category of either advanced, proficient,
basic, and below basic. Schools are evaluated based on their raw scores, their scale scores, and the number of students that qualify for each level.

- **Four Day School Week** – students are required to attend school only four days of the week and are given Mondays off. They have extended school days in order to make up for the day of school that they are not in session.

- **Five Day School Week** – students are required to attend school Monday through Friday and typically have seven hour school day.

- **Independent Variable** – scores on the Algebra I EOC exam and English II EOC exam for the school years from 2008 until 2012. two year period of the five day school week (2008-2010) and two year period of the four day school week (2010-2012)

- **Dependent Variable** – two year period of the five day school week (2008-2010) and two year period of the four day school week (2010-2012)

**Summary.**

This research project will be completed in order to determine the effect of the four day school week on student of achievement on state EOC Exams in the school district. The schedule change was adopted at the beginning of the 2010-2011 school year and has been in effect for two full school years. In order to evaluate student achievement in the two years following the schedule change this project will compare data of student scores on the state EOC exams in the
fields of Algebra I and English II. Data will be compared from the 2008-2009 and 2009-2010 school years to the data collected in the 2010-2011 and 2011-2012 school years on these exams. After a t-test analysis of the collected data is completed it will be easier to analyze the achievement of students. The goal of this research project is to determine if the four day school week is a more effective scheduling model than that of the traditional five day school week. One of the ways to evaluate the effectiveness of the four day school week is to evaluate the differences in student achievement. The easiest way to evaluate student achievement is by using scores on state standardized testing, in this case the EOC Algebra I and EOC English II scores.
REVIEW OF LITERATURE

One of the intriguing aspects of the field of education is that it is ever-changing and must evolve in order to stay effective. Educators and administrators are constantly challenged to find new methods and approaches in an effort to educate the altered 21st century student. In recent years there has been a renewed focus on the educational system of the United States and its deficiencies. The truth of the matter is that students in our country are underachieving compared to past generations and other nations around the world. Both President Bush and President Obama have tried to do their part in guiding our educational system out of the dark ages by promoting reforms like No Child Left Behind and the recent Race to the Top Campaign. The issue that school districts all across the nation are now facing is the reality of increasing student achievement while state and federal funding is being reduced on a yearly basis. Educational and community leaders are being asked to improve results with fewer and fewer resources. Different school districts are approaching this new dilemma with innovative approaches that will hopefully effect change with their students.

Some districts across America and in the state of Missouri are attempting to increase efficiency by adopting a new four-day school week in the place of the traditional five-day school week. While this approach seems innovative and cutting edge it has been adopted in rural school districts in the United States since the Great Depression. Policies dealing with the four-day school week were first implemented in our nation as early as the 1930’s to deal with difficulties of the depression and then became more common during the energy crisis of the 1970’s especially on the West Coast (Koki, 1992). The nation’s budget crisis and other struggles has school districts attempting to find new ways to save money and reduce cost while not effecting the education and learning of its students.
Just like other types of educational reforms, the four-day school calendar has its advantages and disadvantages. Since the sample size of districts that have instituted this new calendar is so small it leaves room for debate as to its effectiveness. Proponents of the four-day school week have provided research that proves that the altered schedule has “increased attendance, increased planning time for teachers, and in some districts has even increased savings on utility, transportation, and food costs” (Anderson & Beasley, 2007, p. 3). Since students have one extra day off of school during the week to schedule appointments and trips, there is fewer distractions and interruptions to the shortened school week which has improved attendance rates in some school districts. Districts that have adopted the four-day school week have also found more of a chance to provide its teachers with beneficial professional development opportunities in order to increase collaboration and teaching procedures. Finally, the four-day school week has been able to save districts money by requiring them to pay support staff and other hourly employees a smaller salary. The four-day school week provides one less day that buses must run, lunch staff must provide breakfast and lunch, and utilities must be used. This decreased cost provides struggling districts some wiggle room with their budgets.

Other benefits of the four-day school week have been described by other case studies in recent years. In some districts long term effects of the shortened school week have seen “graduation rates that were also on the rise and were predicted to be over 80% for the first time in a long time” (Zanter, 2010, p. 7). Positive effects could also be found in student behavior and attitude. Many districts that have adopted the shortened four-day schedule have also found that they have seen students who are less tired and more focused which has increased the entire culture and environment of the entire school district (Kordosky, 2012).
While the four-day school calendar has existed in our nation for nearly 100 years it is not free from criticism and doubt. The shortened school week is accompanied with longer school days but decreased seat time for teachers to interact with students. Advocates of the traditional five-day school week are quick to mention the fact that fatigue for younger students that have to attend school for longer days will ultimately affect their retention and learning (Farbman & Kaplan, 2005). Educational research has recently revealed a development of shortened attention spans in both elementary and secondary students. The longer school day that complements the four-day school week is not ideal for this new trend. Critics of the four-day school week also point to the fact that parents must find childcare services for the additional day off of school (Anderson & Beasley, 2007). While the four-day school week relieves financial pressure on the school district itself, it places additional financial responsibility on families to pay for daycare or other supervision for their school aged children.

Other critics of the shortened school week point to an increased opportunity for underage deviance of students that are not in school (Yarbrough, 2006). While there has been no research that points to an increase in juvenile deviance as a result of the adoption of the four-day school week, opponents of the shortened schedule believe that an increased opportunity invites students to take part in such behavior. Finally, advocates of the five-day school week believe that compensation of support staff and hourly employees is unfair and unethical. Uneven compensation and incentives for support staff in districts using the four-day school week will promote less than satisfactory candidates for jobs (Colorado Department of Education, 2006). Quality district employees that can be compensated better in neighboring districts will be unable to be retained and sub-standard employees will have to be hired.
Since there is obviously disagreement when it comes to the effectiveness of the shortened four-day school week, we are only left to look at the subjective results of the varying educational approaches to determine their success. Often used as the measuring stick of student achievement in a school district is performance on state standardized testing. In the past educational researchers have evaluated the shortened four-day school week in terms of student achievement and have found varying results. Of the research that has been performed in the evaluation of the shortened school week it has been observed that there is little difference in student achievement using one calendar or the other. Colorado State University has been at the forefront of researching the effectiveness of the four-day school week since the early 1990’s. Through their research, Dr. James Daly and Dr. Richard Richberg of Colorado State found that the “analysis of the same grade level across a four-year period provided no clear evidence that the schedule change had any effect on student achievement” (Daly & Richberg, 1994, p. 24). Another similar study in a small rural school district outside of Portland, Oregon found that “the results of the study suggest an advantage for students in terms of better school attendance and earning credits toward graduation, but not in terms of standardized test scores” (Furrer, Magnuson, & Suggs, 2010, p. 17). Finally, a school district outside of New Orleans that adopted the four-day school week in 2010 was able to determine that “student academic achievement has not been hurt by the change in schedule but, did indicate that the adoption of a four-day school week does share a positive significant relationship with performance in both reading and mathematics” (Anderson & Walker, 2012, p. 1). Ultimately it has been assumed that the sample size is just too small to discern any credible results as to the impact of the school calendar on the academic achievement of students. As more school districts begin to adopt the four-day school week, researchers will obtain more data and will be able to better assess the effectiveness of the shortened school week.
Again, results will need to be continued to be collected on a subjective basis in order to truly evaluate the value of both the traditional five-day and the shortened four-day school week.

The subjective evaluation system used to evaluate the effectiveness and success of school districts inside the state of Missouri is known as the Missouri School Improvement Plan or MSIP. This program assesses the success of a school district using a multitude of different standards including graduation rates, attendance rates, college/career readiness, and academic achievement. This final standard of student achievement is evaluated mainly on student performance on Missouri’s standardized test known as the End of Course (EOC) exam. Over the years there have been many state tests to assess mastery levels from the BEST test, to the MMAT test, to the MAP test, and now the EOC exam. Missouri’s EOC exam will eventually be replaced with a national test given to all students at a certain grade level that will evaluate student competencies using the Common Core State Standards. Until this exam is established we will continue to use the EOC exam as an evaluation tool of student achievement.

The Missouri Department of Elementary and Secondary Education (2011) has decided that the End of Course exam is to be taken when a student completes a specific course. Both the Algebra I and Communication Arts (English) II exams have been taken by students since the 2008-2009 school year in the state of Missouri. The Algebra I EOC Exam is a required exam given to students that are enrolled in Algebra I courses. The test is a 35 question multiple choice exam and there is no time limit on the test. The English II EOC Exam is a required exam for students enrolled in English II courses. This test is also a 35 question multiple choice exam and there is no time limit on the test. Scores on both of these exams are given a raw score, which is the number of questions that students answer correctly, and a scale score in which questions are given different values. After the score is collected students are placed into a category of either
advanced, proficient, basic, and below basic. Schools are evaluated based on their raw scores, their scale scores, and the number of students that qualify for each level. The overall effectiveness of a school district and individual buildings are evaluated based on the combination of all MISP standards but student achievement is typically evaluated based on student performance on the state EOC exams. In order to determine the value of the four-day school week in terms of student achievement, student scores on these EOC exams can be used to evaluate the effectiveness.
RESEARCH METHODS

Research design.

This research project is designed in an effort to analyze the effectiveness of the four day school week. In order to evaluate the data collected a t-test analysis will be conducted in order to determine the difference in student achievement on the EOC exams prior to the initiation of the four day school week and the two years following the introduction. The data that will be evaluated for this research project has already been collected and received by the Central Office of the school district. Scores will need to be re-coded into two categories; 1) scores before the four day school week and 2) scores after the four day school week. The data of the scores from two years previous to the four day school week will be compared to the data of scores two years following the four day school week. This will allow for the evaluation of the current schedule as compared to that of the previous five day school week. The dependent variable for this research project is the student scores on the exams. The independent variable for the purposes of this research is the length of week varying between the four and five day school week.

Study group description.

The high school used to conduct this research project is located in a small, rural Midwestern town and is a state accredited school. The school population has fluctuated since the 2008-2009 school year when the school had 301 students. The population increased to 317 students in the 2009-2010 school year only to decrease in the 2010-2011 school year to 271 students. The student population of the high school in the 2011-2012 school year decreased again to 241 students. Attendance at the high school was at 93% in the 2008-2009 school year. Attendance then decreased to 92.8% in both the 2009-2010 and 2010-2011 school years only to rise to 93.5% in the 2011-2012 school year. Finally, the percentage of students eligible for free
or reduced lunch was 25% in the 2008-2009 school year. It increased to 26.6% in the 2009-2010 school year and again to 27.5% in the 2010-2011 school year. Percentage of students eligible for free or reduced lunch increased again in the 2011-2012 school year to 27.9%. The ethnicity of the high school has stayed relatively consistent throughout the four school years examined. The ethnic makeup of the high school during the 2008-2009 school year was 0.7% Asian, 1.6% Black, 1.3% Hispanic, 1.6% Indian, and 94.8% White. During the 2011-2012 school year the ethnicity of the high school had changed to 0.4% Asian, 3.3% Black, 0.4% Hispanic, 0.7% Indian, and 95.2% White.

The results of the English II EOC assessment and the results of the Algebra I EOC assessment will be evaluated through this research project. Students that take the Algebra I EOC assessment at the high school are typically enrolled in Algebra I and are in their freshman year of high school. Students that take the English II EOC assessment at the high school are typically enrolled in English II and are in their sophomore year of high school.

Data collection and instrumentation.

EOC exams are typically taken near the conclusion of the school year and the results are not received until the summer when school is out of session. All of the data that will be evaluated for the purposes of this research project comes directly from the Missouri Assessment Program. The data has already been collected and received by the school district and just needs to be analyzed and evaluated for effectiveness. In order to obtain access to the data that must be analyzed, permission has been received by the school district’s Superintendent. In return for access to this data the school district has requested a summary of the results to be submitted to the School Board and Central Office.
Statistical analysis methods.

The data that will be collected for the purpose of this research project will be analyzed using a t-test analysis. The purpose of the t-test analysis is to classify district performance data, in this case the four and five day school weeks, into categories to identify differences (if any) between district performance outcomes, in this case EOC exam scores. In order to create the t-test analysis of the data Microsoft Excel will be used to create a spreadsheet of the data. After a spreadsheet is created the software program A Statistical Package will be used in order to analyze the data and create the t-test.
FINDINGS

A t-test was conducted in order to determine the difference in performance of students on the 2009 and 2010 Communication Arts and Math EOC exams and their performance on the same exams in 2011 and 2012 after the school had transitioned to a non-traditional four-day school week. The following tables, graphs, and charts will show the results of research based on the statistical raw data found on the Missouri DESE website in 2012. We are looking at two pieces of data. One compares scores on the Algebra I EOC exam from 2009 through 2012 and the other compares student scores on the English II EOC exam from the same period.

Figure 1

t-Test Analysis Results for Math EOC scores during the five-day school week (2009-2010) and four-day school week (2011-2012)

<table>
<thead>
<tr>
<th>Source</th>
<th>Mean</th>
<th>Mean D</th>
<th>t-Test</th>
<th>df</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Five-Day</td>
<td>205.94</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Four-Day</td>
<td>209.10</td>
<td>-3.16</td>
<td>-1.04</td>
<td>178</td>
<td>.298</td>
</tr>
</tbody>
</table>

Note: Significant when p<=0.25

In order to evaluate the effect of the four-day school week on student scores on the Algebra I EOC exam, we took 180 raw scores from the past four years of exam results. Of these 180 scores, 73 were collected from the school years of 2009-2010 when the school was still practicing the traditional five-day school week. Therefore, 107 of the 180 scores were collected from the school years from 2011-2012 in which the district had adopted the four-day school week. The null hypothesis for this analysis is that there is no significant difference between student scores on the EOC Math exams and the length of week that students attend school. The mean (average) score on the Algebra I EOC exam for the five-day school week (2009-2010) was
The mean (average) score on the Algebra I EOC exam for the four-day school week (2011-2012) was 209.10. The Mean Difference between the five-day school week results and the results during the school years using the four-day school week was -3.16. This means that average test scores on the Algebra I EOC exam increased during the four-day school week as compared to the results of the five-day school week. The t-test score of the two pieces of data collected was -1.04. The degree of freedom of the two pieces of data compared was 178. Finally, the p-value of the t-test comparing student scores on Algebra I EOC exams in the five-day and four-day school weeks was .298. The alpha level for this t-test was set at .25. Since the p-value of the analysis is larger than the alpha level it is determined that the null hypothesis was not rejected. There is no significant difference between student achievement on the Algebra I EOC exam and the five-day or four-day school calendar.
In order to evaluate the effect that the school calendar has on student achievement on Algebra I EOC exam scores there was four years of data collected. This chart shows the average scores of students on the exam broken down by school year and then the average of those two years combined. The average student score on the Algebra I EOC exam in 2009 was 202.98. The average score on the Algebra I EOC exam in 2010 was 210.71. The school district was using the five-day school week calendar during these two school years. The average score for students on this exam in the 2009-2010 school years was 205.94. After the completion of the 2010 school year the school district instituted the four-day school week for its students. The average score on the Algebra I EOC exam in 2011 was 210.77 and the average score on the exam in 2012 was 207.8. The average score on the Algebra I EOC exam for the 2011 and 2012 school years was 209.10. This means that the average score on the exam increased 3.16 points after the transition to the four-day school week.
In order to evaluate the effect of the four-day school week on student scores on the English II EOC exam, we took 242 raw scores from the past four years of exam results. Of these 180 scores, 131 were collected from the school years of 2009-2010 when the school was still practicing the traditional five-day school week. Therefore, 111 of the 180 scores were collected from the school years from 2011-2012 in which the district had adopted the four-day school week. The null hypothesis for this analysis is that there is no significant difference between student scores on the EOC English II exams and the length of week that students attend school. The mean (average) score on the English II EOC exam for the five-day school week (2009-2010) was 208.82. The mean (average) score on the English II EOC exam for the four-day school week (2011-2012) was 209.92. The Mean Difference between the five-day school week results and the results during the school years using the four-day school week was -1.10. This means that average test scores on the English II EOC exam increased during the four-day school week as compared to the results of the five-day school week. The t-test score of the two pieces of data collected was -0.622. The degree of freedom (df) of the two pieces of data compared was 240. Finally, the p-value of the t-test comparing student scores on English II EOC exams in the five-day and four-day school weeks was .534. The alpha level for this t-test was set at .25. Since the
p-value of this analysis is larger than the alpha level it is determined that the null hypothesis was not rejected. There is no significant difference between student achievement on the English II EOC exam and the five-day or four-day school calendar.
In order to evaluate the effect that the school calendar has on student achievement on English II EOC exam scores there was four years of data collected. This chart shows the average scores of students on the exam broken down by school year and then the average of those two years combined. The average student score on the English II EOC exam in 2009 was 207.75. The average score on the English II EOC exam in 2010 was 210.10. The school district was using the five-day school week calendar during these two school years. The average score for students on this exam in the 2009-2010 school years was 208.82. After the completion of the 2010 school year the school district instituted the four-day school week for its students. The average score on the English II EOC exam in 2011 was 209 and the average score on the exam in 2012 was 211.37. The average score on the English II EOC exam for the 2011 and 2012 school years was 209.92. This means that the average score on the exam increased 1.10 points after the transition to the four-day school week.
Both the Algebra I and English II End of Course exams were introduced in 2009 for the first time at the high school level. Based on the results collected from the high school student scores and the chart shown above it can be seen that students performed better on both exams after the transition to the four-day school week. The average student score on the English II EOC exam increased 1.10 points after the school district instituted their new school calendar. Likewise the average scores on the Algebra I EOC exam increased by 3.16 after the students began attending school only four days a week.

This research project was conducted in order to determine the answer to two research questions. The first research question was “is there a difference between student scores on state EOC Math and EOC Communication Arts exams in the four day school week as compared to that of the traditional five day school week?” Based on the findings of this research project we can determine that there is a difference in student achievement on state Math and Communication Arts exams when students are taught using the four-day school week calendar as compared to students taught using the five-day
week calendar. While there is a difference of scores on student exams, there is not a significant enough
difference to promote one method over the other. The null hypothesis for this research was that “there is
no significant difference between student scores on the EOC Math and EOC Communication Arts exams
and the length of week that students attend school.” Based on the results of the t-test analysis this
hypothesis was accepted. There is a difference between student achievement on Math and
Communication Arts EOC Scores in the five-day school and four-day school week but that difference is
not significant enough.

The second research question for this project was “did EOC exam scores on the Algebra I
EOC and English II EOC increase, decrease, or stay the same before the change to a four day
school week and after the change in the School District?” Based on the results of the
t-test analysis performed with data from student scores from the past four years it can be
determined that the mean score on both Algebra I and English II EOC exams have increased
since the implementation of the four-day school week in the school district at the conclusion of
the 2009-2010 school year. Though there was an increase, this increase was not significant
enough to promote one school calendar over the other.
CONCLUSIONS AND RECOMMENDATIONS

The results reported from this study show that there is no significant difference between student achievement on Algebra I and English II EOC exams two years previous to the adoption of the four-day school week and the two years following in the school district. There was an increase in the average score of these two exams but the difference is not significant enough to promote one school calendar over the other. The t-test results from the Algebra I EOC exam results comparing the two year period previous to the institution of the four-day school week and the results from the two years following the adoption indicated a p-value of .298. The t-test of the English II EOC results from the same testing period revealed a p-value of .534. Both of these p-values were above the alpha level which was set at 0.25. Based on these results it can be concluded that the null hypothesis that was being tested was supported. There is not a significant difference in student achievement of Algebra I and English II EOC scores during the four-day and five-day school schedules.

Educational reforms and transitions as drastic as moving the school calendar from a five-day to a four-day format will undoubtedly have its advantages and disadvantages. School districts that have adopted the four-day school week have a seen a shift in student attendance, graduation rates, and decreased operating costs. Drawbacks of the four-day school week include a financial burden on parents to finding daycare for young students and a longer school day that could decrease retention. The results of the study conducted in this research project are consistent with studies conducted in Colorado, Portland, and New Orleans in finding that the school calendar does not have a significant effect on student achievement and performance.

At the conclusion of this study there are some further studies that could be conducted. There is simply not enough statistical data that has been collected from schools that have adopted
the four-day school week to determine the validity of the schedule in comparison to the decades of data that we have from student achievement in the traditional five-day school week. Researchers will need to continue to use subjective measuring tools in order to determine the effectiveness of the non-traditional schedule. Additional studies could be performed using other subjective tests such as the ACT and SAT exams in order to compare the performance of students that were taught in differing school calendars. Researchers could also compare exam results of students on other EOC exams in the state of Missouri in the subjects of Science, English, Mathematics, and Social Studies in order to determine if there is a correlation or not. In the near future educational leaders are planning on releasing a required national test that will evaluate all students nationwide on their abilities. The results of this exam will obviously be used as a tool to measure the success of individual school districts. It will also create the opportunity to evaluate the effectiveness of different teaching methods, approaches, and schedules across the entire nation.

As the demands of our educational system continue to increase and we are required to improve student achievement while having our budgets consistently decreased, we will need to become more and more innovative and creative as educators and administrators. One option that school districts in financial strain have is to begin looking at decreasing operating cost and cutting out one of their five school days in order to do so. One question remains though, what effect does a school’s calendar have on student achievement and performance? This study, and many others like it, concludes that there is no significant effect on student success when looking at the four or five day school week. However, the data collected is such a small sample that more results should be collected in order to truly verify the validity of the four-day school week as an option for school districts to adopt.
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