

The Influence of a Four Day School Week on ACT Scores

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Abstract

This study was completed to find if there is a significant difference in ACT test scores on the standardized assessment when students attend a four day school week versus a traditional five day school week. Research shows that students learn at different rates and this should be considered when preparing students for standardized tests. Students typically prepare for the ACT assessment. After collecting and analyzing the findings of this study, current research, and the statistical data from the Missouri Department of Elementary and Secondary Education it is found that there is not an impact on test scores based the number of days in a school week. Student achievement was similar on the ACT assessment for those students that remained in five day school week when compared with the achievement of students placed in the four day school week. The ACT focuses on Mathematical and English Language Arts. After collecting and analyzing the findings of this study, current research, and the statistical data from the ACT exam, it is found that there is not an impact on test scores based on the length of the school week.

Introduction

Background, Issues and Concerns

There have been concerns regarding the issue of a traditional five day school week versus a four day school week and its effect on standardized states tests. It is important that a district is able to meet the needs of students. Students need to be mastering the objectives put forth by the state of Missouri. An issue in favor of the four day school week is a financial savings. Schools could potentially save money on transportation and energy costs. A concern is the need for a parent to find childcare or take off work on the extra day school is not in session. Students need to perform at a high level on state tests. Some may wonder if there is a difference or relationship between the length of the school week and scores earned on standardized tests.

Practice under Investigation

The practice under investigation will be looking at ACT scores. There was an investigation to see if there is a significant difference in ACT scores based on the length of the school week. This looked at the data provided by the Department of Elementary and Secondary Education (DESE).

School Policy to be Informed by Study

Every school district in the State of Missouri is tracked by the ACT scores of the students that attend that school. If there is a significant difference in ACT scores

based on the length of the school week teachers should make sure they are differentiating instruction so they are able to reach all students.

Conceptual Underpinning

Every school district has different policies that affect students and ultimately student achievement. One difference that has occurred in some Missouri school districts is the idea of a four day school week. The argument is students will learn more and have higher achievement by us teaching deeper not wider. Robert Marzano's classroom instruction that works can help teachers to use multiple approaches to reach student and increase achievement. Depending on the length of the school week students and teachers may have to rethink how they reach mastery. Theoretically students should learn the same whether they are attending a five day or a four day school week. Teaching strategies that yield high results should be used. Student achievement will not be changed by moving from a five day week to a four day week.

Statement of the Problem

The problem is how to structure the school week to get the maximum student achievement at the most economical benefit. If there is a gap on the performance of the ACT scores based on the length of the school week teachers need to know how to differentiate instruction so that they can use strategies that have a great impact on student achievement.

Purpose of the study.

To find if there is a significant difference in ACT scores based on the implementation of a four day school week.

Research question

RQ: Is there a significant difference in ACT Composite scores between a five day school week and a four day school day?

Null hypothesis.

Ho: There is not a significant difference in ACT Composite scores between a five day school week and a four day school day.

Anticipated benefits of the study.

If there is a difference in ACT scores of students on a four day school week compared to a traditional school week.

Definition of Terms

ACT- American College Testing- College readiness assessment, standardized test for college admissions.

Four day school week – A school week with instruction on four days.

Traditional school week – A school week with instruction on five days.

Summary

A study was conducted to see if there was a significant difference in the ACT scores of students on a four day school week compared to a traditional 5 day school week. If the analysis test concludes there was a significant difference then the school district should consider returning to a traditional 5 day school week. After this study is completed, school districts can benefit by looking at the performance data from the ACT scores to provide insight into the decision to follow a four day versus a traditional five day school week.

Review of Literature

For the Review of Literature many areas were researched to find evidence to support or reject the significance of a four day school week versus a traditional five day school week. Specifically this section will go into detail on the importance of ACT testing, what findings other schools around the country have observed with a four day school week and the research behind why students may benefit from a four day school week.

College admittance requires that a student take a standardized test. The ACT is based on information your student is learning in high school. It is a multiple-choice test that measures the student's understanding of English, Math, Reading, and Science. The ACT test is directly related to what students are learning in their courses. The ACT test is more than a college admissions test. Taking the test lets the student know if they are on track for college. The State of Missouri tracks students' ACT scores. The test points out a student's academic strengths and areas for improvement. Students can take the test multiple times to improve their score. The ACT develops a comprehensive profile that tells colleges about the student's work in high school and their academic abilities. Many students are able to connect with colleges and scholarship agencies as a result of taking the ACT (Feaster, 2002)

With the rising cost of funding and the question of adequate funding more schools are looking into the concept of a four-day school week. According to Donis-Keller (2009) "The four-day school has a nearly forty year history in the United States. Approximately 19 states currently have some school districts that operate on a four-day week. The majority of these schools are west of the Mississippi and include, Arizona,

California, Colorado, Idaho, Kansas, Kentucky, Louisiana, Michigan, Minnesota, Missouri, Montana, New Mexico, Oregon, South Dakota, Texas, Utah, Wisconsin, and Wyoming” (p. 13). The four-day school week is currently most widely used in the states of Colorado, Wyoming and New Mexico (Dam, 2006). The school district in Cimarron New Mexico has the longest established use of the four-day schedule in the United States. They have consistently utilized the four day schedule since 1973 (Feaster, 2002). The majority of districts that implement the four-day school week are small rural districts.

In the State of Missouri the concept of a four day school week is a much newer concept. In 2009 The Missouri State Legislature passed SB 291. This created §171.029, RSMo. The bill stipulated that schools still have to provide the same number of hours (1044) per school year, at least 142 days per year, and if academic achievement on the APR drops over 2 consecutive years then the district must return to a 5 day week. (Chadwell, 2009). A School district in Northwestern Missouri was the first in Missouri to implement the four-day school week in 2009. Currently four school districts in Missouri have implemented a four day school week.

The impact of a four day school week is typically considered in four areas; 1. Financial savings, 2. Student achievement, 3. Other student and teacher outcomes, and 4. Stakeholder satisfaction. In an evaluation of 62 Colorado school districts using a four day school week, Dam (2006) notes the downward trend in financial outcomes in transportation, food service, utilities, and staff. Some Missouri schools are slowly transitioning to a four day school week. According to the US Department of Education more than 100 school districts nationwide have turned to a shorter school week to avoid

eliminating programs and teachers. Some districts have reported benefits that go beyond cost savings. Districts report that students are more attentive, less tired and less likely to stay home from school (US News, 2011). Teacher attendance has also seen an increase. According to Fopay (2010), “Having already a fewer number of days in school than other countries’; it is believed that more days out of school is doing a disservice to education in America. There is also the aspect of child care for parents with full time jobs. Either the parent may have to take that “fifth day” off and lose salary, or pay to arrange for child care. This could also hurt some students because school is where they might have “their best meals and the most comfortable places.” (p. #22).

The length of a school week is an issue that is still in great debate. Schools are looking for the key that will help them get the highest ACT test scores. Could a four day school week be that key? Some research says yes, some says no. The ACT results from schools that have implemented a four day school week claim that the best way to educate our students is to separate them based upon gender but to be successful time must be put in before this program is implemented to educate teachers, administrators and parents. If this time is taken, then the results coming from these schools are coming back with a decline in discipline problems and a rise in academic achievement (Chadwell, 2009).

Research Methods

Research Design

A descriptive analysis will be conducted to see if there is a difference in achievement based on a four day school week versus a traditional five day school week. The independent variable being tested is the length of the school week. While the dependent variable tested is the ACT scores of students enrolled in a four day versus a five day school week.

Study Group Description

The students being studied are students that attended a four day school week from four school districts in the State of Missouri. These scores will be gathered from the Department of Elementary and Secondary Education (DESE).

Data Collection and Instrumentation

Archived data from DESE will be collected to identify the scores of students that attended a four day school week versus a five day school week.

Statistical Analysis Methods

A descriptive analysis will be conducted with the data. The descriptive analysis will be conducted to find if there is a significant difference in student ACT scores based on a four day or five day school week.

Findings

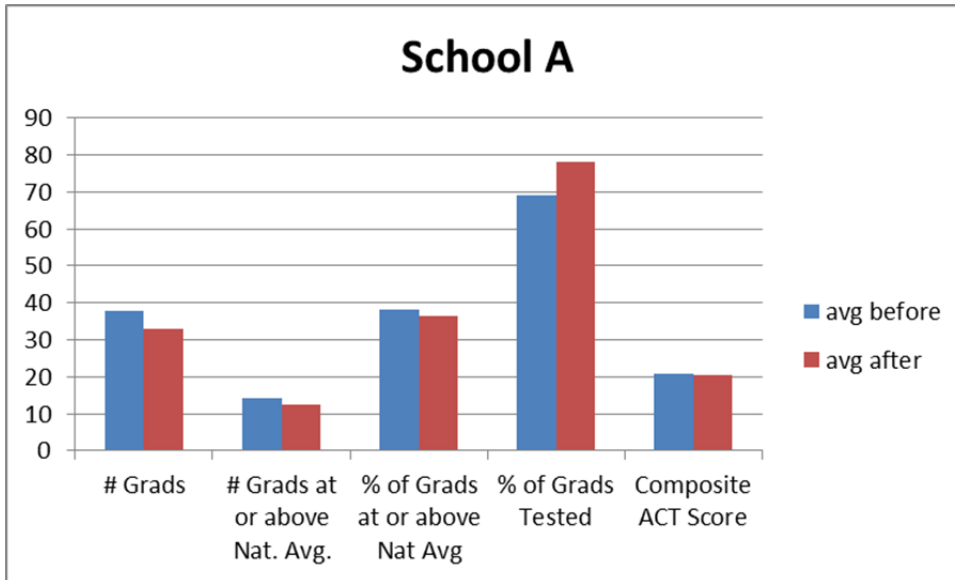
To answer the research questions descriptive analysis was conducted using Excel (Microsoft, 2013). Summary, tables and graphs are provided to illuminate the findings. The data was obtained from the Missouri Department of Elementary and Secondary's website.

SUMMARY DESCRIPTIVE ANALYSIS green =5 day yellow=4 day

District: School A Started 4 day week 2010-2011 school year

Year	# Grads	# Grads at or above Nat. Avg.	% of Grads at or above Nat Avg	% of Grads Tested	Composite ACT Score
2013	39	16	41	76.92	21.6
2012	32	11	34.4	78.13	20.2
2011	23	6	26.1	78.26	19.7
2010	38	17	44.7	78.95	20.8
2009	40	11	27.5	62.5	20.2
2008	43	16	37.2	72.09	20.9
2007	30	13	43.3	63.33	21.7

	# Grads	# Grads at or above Nat. Avg.	% of Grads at or above Nat Avg	% of Grads Tested	Composite ACT Score
avg before	37.75	14.25	38.175	69.2175	20.9
avg after	33	12.5	36.55	78.065	20.575



When looking at the ACT scores of Schools that have moved to a four day school week in Missouri the first school to be analyzed is School A. School A moved to a four day school week in the 2010-2011 school year. The analysis discusses the data of the schools on a five day school week and then on a four day school week. Prior to 2010 School A was on a traditional five day schedule. As a five day school week the average number of graduates were 37.75. The number of graduates at or above the national average was 14.25. The percentage of graduates at or above the national average was 38.175%. The percentage of graduates tested was 69.2175%. The composite ACT school as a five day school was 20.9. After moving to a four day school week School A had some changes in data. The number of graduates was 33. The number of graduates at or above the national average was 12.5. The percentage of graduates at or above national average was 36.55. The percentage of graduates tested was 78.065. The composite ACT score was 20.575.

School A – T-Test Analysis Results for ACT Score Comparison Before and After Adoption of a “4-Day Week.”

Source	Mean	Mean D	t-test	df	p-value
4 Day Week (n=4)	20.58				
5 Day Week (n=3)	20.93		+0.3	5	.388

Note: Significant when $p \leq 0.10$

A T-test was performed for School A. T-Test Analysis yielded results for comparison before and after adoption of "4-Day" week for the ACT score. The independent variable was length of the school week. The dependent variable was the ACT scores. Four schools were studied. Each school's scores were divided into before and after the schedule change starting at 2007 till present day. The total N for School A was 7. The before N was 4. The after N was 3. The total mean for School A was 20.72. The before group had a mean of 20.93. The After group had a mean of 20.58. The t-test value was +0.3. The degree of freedom was 5.

The null hypothesis was: There is not a significant difference in the ACT scores between the traditional five day school week as opposed to the four day school week. The null is not rejected because the p-value is .388, which is greater than the alpha level of 0.10. This means that there is not a significant difference in the ACT scores between the traditional five day school week as opposed to the four day school week.

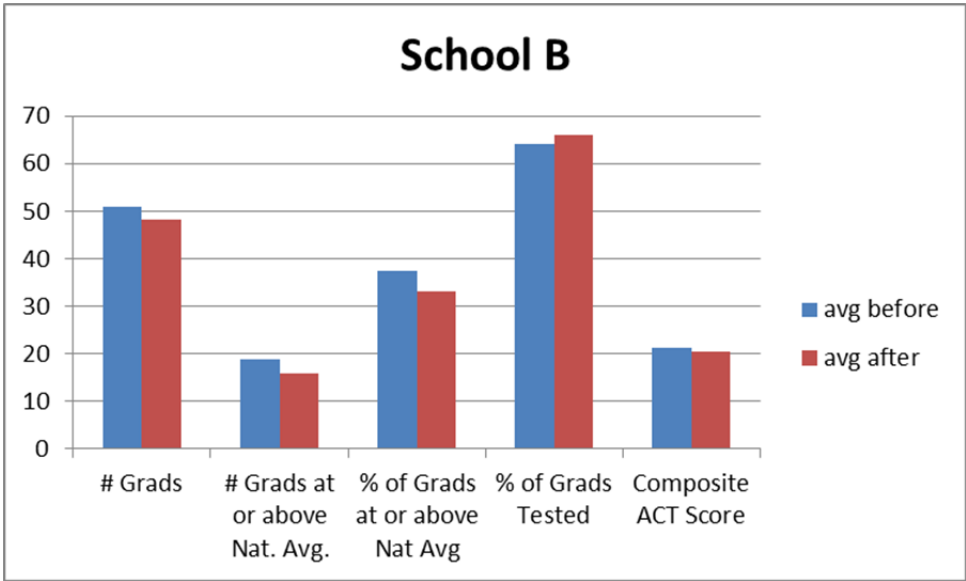
SUMMARY DESCRIPTIVE ANALYSIS FOR SCHOOL B

green =5 day yellow=4 day

District: School B Started 4 day week 2011-2012 school year

Year	# Grads	# Grads at or above Nat. Avg.	% of Grads at or above Nat Avg	% of Grads Tested	Composite ACT Score
2013	41	14	34.1	56.1	21.3
2012	36	10	27.8	52.78	21.7
2011	44	12	27.3	61.36	20
2010	47	17	36.2	57.45	20.8
2009	56	19	33.9	50	21.8
2008	50	20	40	70	21.7
2007	47	18	38.3	72.34	20.4

	# Grads	# Grads at or above Nat. Avg.	% of Grads at or above Nat Avg	% of Grads Tested	Composite ACT Score
avg before	51	19	37.4	64.11333333	21.3
avg after	48.41666667	15.83333333	33.24166667	66.10527778	20.6



When looking at the ACT scores of Schools that have moved to a four day school week in Missouri the first school to be analyzed is School B. School B moved to a four day school week in the 2011-2012 school year. The analysis discusses the data of the schools on a five day school week and then on a four day school week. Prior to 2011

School B was on a traditional five day schedule. As a five day school week the average number of graduates were 51. The number of graduates at or above the national average was 19. The percentage of graduates at or above the national average was 37.4%. The percentage of graduates tested was 64.1%. The composite ACT school as a five day school was 21.3. After moving to a four day school week School B had some changes in data. The number of graduates was 48. The number of graduates at or above the national average was 15.8. The percentage of graduates at or above national average was 33.2. The percentage of graduates tested was 66.1. The composite ACT score was 20.6.

School B – T-Test Analysis Results for ACT Score Comparison Before and After Adoption of a “4-Day Week.”

Source	Mean	Mean D	t-test	df	p-value
4 Day Week (n=3)	21.				
5 Day Week (n=4)	21.175		+3.06	5	.01405

Note: Significant when $p \leq 0.10$

A T-test was performed for School B. T-Test Analysis yielded results for comparison before and after adoption of "4-Day" week for the ACT score. The independent variable was length of the school week. The dependent variable was the ACT scores. Four schools were studied. Each school's scores were divided into before and after the schedule change. The total N for School B was 7. The before N was 4. The after N was 3. The total mean for School B was 21.1. The before group had a mean of 21.175. The After group had a mean of 21. The t-test value was +3.06. The degree of freedom was 5.

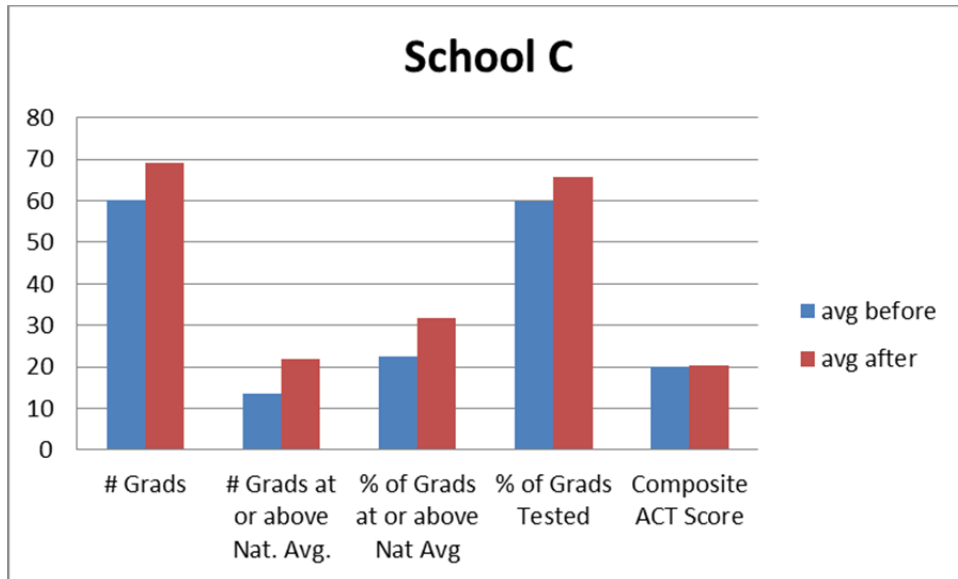
The null hypothesis was: There is not a significant difference in the ACT scores between the traditional five day school week as opposed to the four day school week. The null is rejected because the p-value is .01405, which is less than the alpha level of 0.10. The null is not rejected since the p-value is 01.405 and the alpha level 0.1.

Four Day School Week 17

District: School C Started 4 day week 2010-2011 school year

Year	# Grads	# Grads at or above Nat. Avg.	% of Grads at or above Nat Avg	% of Grads Tested	Composite ACT Score
2013	73	26	35.6	71.23	20.8
2012	61	22	36.1	63.93	21.2
2011	68	22	32.4	66.18	20.1
2010	75	17	22.7	61.33	19.3
2009	56	15	26.8	64.29	19.7
2008	75	17	22.7	64	19.3
2007	49	9	18.4	51.02	20.8

	# Grads	# Grads at or above Nat. Avg.	% of Grads at or above Nat Avg	% of Grads Tested	Composite ACT Score
avg before	60	13.66666667	22.63333333	59.77	19.93333333
avg after	69.25	21.75	31.7	65.6675	20.35



When looking at the ACT scores of Schools that have moved to a four day school week in Missouri the first school to be analyzed is School C. School C moved to a four day school week in the 2010-2011 school year. The analysis discusses the data of the schools on a five day school week and then on a four day school week. Prior to 2010 School C was on a traditional five day schedule. As a five day school week the average number of graduates were 60. The number of graduates at or above the national average was 13.6. The percentage of graduates at or above the national average was 22.6%. The percentage of graduates tested was 59.77%. The composite ACT school as a five day school was 19.9. After moving to a four day school week School C had some changes in data. The number of graduates was 69.25. The number of graduates at or above the national average was 21.75. The percentage of graduates at or above national average was 31.7%. The percentage of graduates tested was 65.6%. The composite ACT score was 20.35.

School C – T-Test Analysis Results for ACT Score Comparison Before and After Adoption of a “4-Day Week.

Source	Mean	Mean D	t-test	df	p-value
4 Day Week (n=4)	20.35				
5 Day Week (n=3)	19.93		-2.16	5	.04159

Note: Significant when $p \leq 0.10$

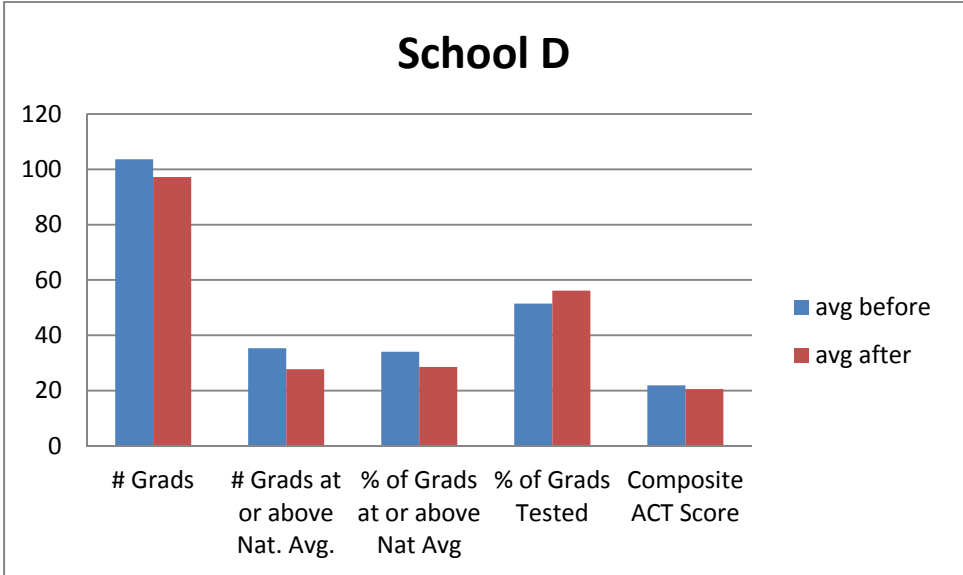
A T-test was performed for School C. T-Test Analysis yielded results for comparison before and after adoption of "4-Day" week for the ACT score. The independent variable was length of the school week. The dependent variable was the ACT scores. Four schools were studied. Each school's scores were divided into before and after the schedule change. The total N for School C was 7. The before N was 3. The after N was 4. The total mean for School C was 20.17. The before group had a mean of 19.93. The After group had a mean of 20.35. The t-test value was -2.16. The degree of freedom was 5.

The null hypothesis was: There is not a significant difference in the ACT scores between the traditional five day school week as opposed to the four day school week. The null is rejected because the p-value is .04159, which is less than the alpha level of 0.10. This means that there is a significant difference in the ACT scores between the traditional five day school week as opposed to the four day school week.

Four Day School Week 20

District: School	D Started 4 day school week 2012-2013					
Year	# Grads	# Grads at or above Nat. Avg.	% of Grads at or above Nat Avg	% of Grads Tested	Composite ACT Score	
2013	92	28	30.4	57.61	20.5	
2012	99	33	33.3	61.62	20.9	
2011	95	24	25.3	55.79	19.8	
2010	103	26	25.2	49.51	21.1	
2009	102	32	31.4	57.84	21.3	
2008	103	31	30.1	44.66	21.9	
2007	106	43	40.6	51.89	22.5	

	# Grads	# Grads at or above Nat. Avg.	% of Grads at or above Nat Avg	% of Grads Tested	Composite ACT Score
avg before	103.6666667	35.33333333	34.03333333	51.46333333	21.9
avg after	97.25	27.75	28.55	56.1325	20.575



When looking at the ACT scores of Schools that have moved to a four day school week in Missouri the first school to be analyzed is School D. School D moved to a four day school week in the 2012-2013 school year. The analysis discusses the data of the schools on a five day school week and then on a four day school week. Prior to 2010 School D was on a traditional five day schedule. As a five day school week the average number of graduates were 103.6. The number of graduates at or above the national average was 35.3. The percentage of graduates at or above the national average was

34%. The percentage of graduates tested was 51.4%. The composite ACT school as a five day school was 21.9. After moving to a four day school week School D had some changes in data. The number of graduates was 97.25. The number of graduates at or above the national average was 27.75. The percentage of graduates at or above national average was 28.55%. The percentage of graduates tested was 56.13%. The composite ACT score was 20.5.

School C – T-Test Analysis Results for ACT Score Comparison Before and After Adoption of a “4-Day Week.

Source	Mean	Mean D	t-test	df	p-value
4 Day Week (n=2)	20.35				
5 Day Week (n=5)	19.93		-0.28	5	0.3953

Note: Significant when $p \leq 0.10$

A T-test was performed for School D. T-Test Analysis yielded results for comparison before and after adoption of "4-Day" week for the ACT score. The independent variable was length of the school week. The dependent variable was the ACT scores. Four schools were studied. Each school’s scores were divided into before and after the schedule change. The total N for School D was 7. The before N was 5. The after N was 2. The total mean for School D was 21.4. The Before group had a mean of 19.93. The After group had a mean of 20.35. The t-test value was -0.28. The degree of freedom was 5.

The null hypothesis was: There is not a significant difference in the ACT scores between the traditional five day school week as opposed to the four day school week. The null is not rejected because the p-value is 0.3953, which is greater than the alpha level of 0.10. This means that there is not a significant difference in the ACT scores between the traditional five day school week as opposed to the four day school week.

Conclusions and Recommendations

The outcome of this study does not show that there was an impact in the ACT scores when students attended a four day versus a five day school week.

Review of Findings

1. For School A the average ACT score was the same with a composite score of 20 for those students that attended a four day school week when compared with the average ACT score of students attending a five day school week. A T-test was performed. The results were the total mean for School A was 21.1. The before group had a mean of 20.93. The After group had a mean of 20.58.
2. For School B the average ACT composite score of 20.6 for those students that attended a four day school week when compared with the average ACT composite score of 21.3 for students attending a five day school week. A T-test was performed. The results were the total mean for School B was 21.1. The before group had a mean of 21.1 The After group had a mean of 21.175.
3. For School C the average ACT composite score of 20.35 for those students that attended a four day school week when compared with the average ACT composite score of 19.9 for students attending a five day school week. A T-test was performed. The results were the total mean for School C was 20.17. The before group had a mean of 19.93. The After group had a mean of 20.35.

4. For School D the average ACT composite score of 20.5 for those students that attended a four day school week when compared with the average ACT composite score of 21.9 for students attending a five day school week. A T-test was performed. The results were the total mean for School D was 21.4. The Before group had a mean of 21.32. The After group had a mean of 20.7.

Every school district has different policies that affect students and ultimately student achievement. One difference that has occurred in some Missouri school districts is the idea of a four day school week. The argument is students will learn more and have higher achievement by us teaching deeper not wider. Robert Marzano's classroom instruction that works can help teachers to use multiple approaches to reach student and increase achievement. Depending on the length of the school week students and teachers may have to rethink how they reach mastery.

After concluding this study further research could be conducted. There are many schools across the United States that have implemented a four day school week. Research could be conducted comparing the ACT test scores of the students attending a four day school week to students that have attended a traditional five day a week school.

A descriptive analysis and a T-test were performed. The null hypothesis was: There is not a significant difference in the ACT scores between the traditional five day school week as opposed to the four day school week. The null is rejected because the p-value of all the T-test was less than the alpha level of 0.10. This means that there is not a significant difference in the ACT scores between the traditional five day school week as opposed to the four day school week.

Depending on the length of the school week students and teachers may have to rethink how they reach mastery. The conceptual underpinning was that theoretically students should learn the same whether they are attending a five day or a four day school week. Teaching strategies that yield high results should be used. Student achievement will not be changed by moving from a five day week to a four day week. The research performed supports the conceptual underpinning. There was not a significant difference in the ACT test scores from a four day school week to a five day school week.

Could there be a difference every year or just initial years of the program with a plateauing effect after the first year? Also studies could be conducted comparing the effectiveness of implementation of different schools or even states to each other. The descriptive analysis would be an effective measurement tool to high school level data collected from the ACT.

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