

RUNNING HEAD: TUTORING TO INCREASE STUDENT ACHIEVEMENT

USING TUTORING TO INCREASE STUDENT ACHIEVEMENT
ON END OF COURSE ASSESSMENTS

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Abstract

This study investigates if after school tutoring can help improve student achievement on state required tests. The research includes findings which answer the question, “does after school, tutoring during lunch time and/or Saturday School tutoring help increase student achievement?” This research was conducted with the authorization of all students and teachers. In addition, an anonymous survey was conducted to gather input from students and parents regarding which options are best for tutoring, is it after school or Saturday? Findings indicate that tutoring whether it is conducted after school, during the lunchtime or on Saturday improves student achievement. The findings were analyzed using the ASP statistical software. The alpha level was set at 0.25 to determine if there is a significant difference or no difference in test scores after tutoring has occurred.

Introduction

The Missouri Department of Elementary and Secondary Education reported that the school being studied has not met adequate yearly progress for Communication Arts and Mathematics since 2002. There has been some increase in areas but not enough to contribute to the overall targets and indicators set by the State of Missouri. (Department of Elementary and Secondary Education, 2010)

Based on this information, approval was acquired to conduct a survey to explore if students who needed extra help would consider tutoring after school, during lunchtime or on Saturday to raise their test scores on the required state tests. Several teachers and the instructional coaches volunteered to tutor the students. The student selection was based on students who were “basic” or scored “proficient” on three of the required state tests and gender.

Background, Issues And Concerns

The No Child Left Behind Act mandates that schools ensure all students pass state proficiency exams in reading and math by the 2013–2014 academic year. Schools receiving Title 1 funds that have not made adequate yearly progress for three or more years are required to offer parents an opportunity for their children to receive supplemental educational services (SES), usually in the form of tutoring. Although this provision has been part of the law since its inception, Borja (2007) reported that only 23% of eligible students (585,000 of 2.5 million) received NCLB tutoring in 2005–2006.

Not a single state has provided data to show that students enrolled in these programs have made appreciable gains (Lewis, 2006). In addition, the 2006 U.S. Department of Education’s Title I report indicated that the number of Title I schools identified as “in need of improvement” for failing to make adequate yearly progress nearly doubled between 2005 and 2006. (Davis, 2006).

Although little evidence supports the effectiveness of SES tutoring programs, tutoring has a long documented history as a reliable method to improve student achievement (Slavin, 1999). Tutoring, as a supplement to classroom teaching, is generally considered the most powerful form of instruction for increasing underachieving students’ reading achievement (Burns, Senesac, & Symington, 2004).

Class size ratios are 14 to 1, lower than state averages. The test scores are below 25% proficient or advanced in Communication Arts and 32% proficient or advanced in Mathematics. Graduation rates

are below 65% and graduates are not prepared for college or the workforce. Instructional delivery is not meeting all students' needs. Most schools do not demonstrate a culture of learning and high expectations for students and staff. (School District's Transformation Plan)

Test scores are extremely low at this particular high school. Five students that have low-test scores, who are currently in the 11th grade since the beginning of the school year, have been tracked for the purpose of this research. Student achievement is one of the top goals this school year.

Practice under investigation.

The investigation of this study is to determine if tutoring will help improve the test scores of a selected group of 11th grade students. The following research indicates that tutoring is beneficial to any student preparing for post-secondary success.

School policy to be informed by study.

In addition to the Title 1, this school has a School Improvement Grant sponsored by a university in Missouri. With this grant, two new programs were adopted to help increase test scores in Mathematics and Communication Arts. Furthermore, the research will determine if tutoring will help increase test scores on the state mandated assessments.

Currently, this school does not have a tutoring program or policy that outlines what is needed when students are not achieving the desired results on mandated state tests. This study is to inform the administration staff that a program needs to exist to help improve test scores.

Conceptual underpinning.

Teachers facilitate learning for several reasons: the creative planning, the pulling together of ideas, the development and organization of curriculum, the fascination of seeing students when they learn something new on a daily basis. Students are inspired by the very inspiration that drives teachers to teach. Sometimes students need additional learning avenues to help them be successful and achieve higher test scores. Students who are low achieving in theory can benefit from tutoring with a one-on-one instructor. Students who were performing low in Algebra II, benefited from the tutoring. However, there was no difference in test scores after tutoring for the American Government End of Course Exam.

Statement of the problem.

The problem is the school is faced with increasing test scores to re-gain accreditation.

Purpose of the study.

The purpose of the study is to reveal if tutoring by teachers during school will improve test scores or is there a need to hire outside tutors for after school tutoring. The information gathered through this research will be used to illustrate the need for some type of implementation of tutoring either after school, during lunch time or on Saturdays (with transportation provided) to help students improve scores on required state tests.

Research question.

RQ1. Is there a difference in End of Course (EOC) exams scores between students who receive tutoring and students who did not receive tutoring?

Null Hypothesis

There is no difference in end of course exams after tutoring for Algebra II.

Anticipated benefits of the study.

The results of this study will inform school officials about the benefits of tutoring and implementing new programs to raise test scores.

Definition of terms.

Alpha Level - alpha is the probability of making a Type I error (rejecting the null hypothesis when the null hypothesis is true).

Degree of Freedom - The concept of degrees of freedom is central to the principle of estimating statistics of populations from samples of them.

Mean - The most common expression for the mean of a statistical distribution with a discrete random variable is the mathematical average of all the terms.

Null hypothesis (H_0) - is the negative (null) form of the hypothesis, *i.e.*, the behavior will not be found.

P value - The p-value measures consistency by calculating the probability of observing the results from your sample of data or a sample with results more extreme, assuming the null hypothesis is true. The smaller the p-value, the greater the inconsistency.

Standard Deviation Error - The standard error is a measure of the variability of a statistic. It is an estimate of the standard deviation of a sampling distribution. The standard error depends on three factors:

- N: The number of observations in the population.
- n: The number of observations in the sample.
- The way that the random sample is chosen.

T-Test - The t test employs the statistic (t) to test a given statistical hypothesis about the mean of a population (or about the means of two populations).

Summary.

A study was conducted to see if there was a significant difference in the End of Course (EOC) test scores for Algebra II and American Government. If the t-test concludes there was a significant difference, then tutoring does help students improve EOC test scores. After this study is completed, this school will benefit by offering tutoring after school.

Review of Literature

In the journal article *No Child Left Behind: An Assessment of an After-School Program on Academic Performance Among Low-Income, At-Risk Students* (Crawford & Zosky, 2003) a quasi-experimental design was conducted on an after-school program for students participating for a one-year term. The question at hand was whether or not this after-school program increased student academic performance.

Similarly, the journal article *The Promise of After-School Programs* (Miller, 2001) describes various aspects and attributes of after-school programs and the importance they may have on children. The author states: “growing evidence suggests that after-school program participation is associated with higher grades and test scores, especially for low-income students” (Miller, 2001, p.7). Improvements in positive behavior include better social and behavioral adjustments, better relations with peers, and effective conflict resolution strategies with more parent involvement.

Socioeconomic status indicates that poverty level students do not value education. Research indicates that poverty rates among American children have reached as high as 22 percent in recent years, and from this historically elevated figure, perhaps a third can be described as experiencing “persistent” or “long-term” poverty (Hernandez, 1997; Mayer, 1997; Brady, 2003). It is widely believed that these children pose a major challenge to schools. Many reside in central-city neighborhoods or relatively isolated rural areas, compounding existing obstacles to equal educational opportunities and academic success. (Books, 2004) Yet, studies consistently document that most educators themselves come from middle-class backgrounds, making it difficult for them to relate personally with students who live in poverty (Zeichner, 2003).

The following article Saturday Schools and Tutoring as Interventions answers the Question: How effective are Saturday School and Tutoring as intervention strategies?

The major goal of high schools is to prepare students for post-secondary success. And provide them with the skills to be successful. In order to do this, each student must have access to a high quality instructional program and ample time to pursue and develop depth in the different content areas. Nationally, high school dropout rates from 2000-2008, have increased from 11% to 8%, although it is much higher for African-Americans and Hispanics than for other students (National Center for Education Statistics).

The achievement of U.S. students is often compared with that of students from other countries. But by one measure, time in the classroom, the United States trails other countries. According to research done by Finn (2010):

- Chinese students attend school 41 more days and receive 30% more instructional time than American students
- Students in Singapore attend school 40 weeks a year
- Korean students routinely attend Saturday School.

Additionally, by age 18, American students will have spent only 9% of their time in school leaving 91% of their time for other activities. American adolescents spend approximately 7.5 hours a day using some form of entertainment media, equally 53 hours a week. But they spend, on average, only 30 hours a week in school (Finn).

Making good use of available instructional time is critical if high schools are going to provide appropriate opportunities for students so that they are prepared for the post-secondary world. One strategy used in many districts is Saturday school. Another is to support students with tutoring. This brief will examine both options.

Saturday schools generally fall into three categories. Many are designed to provide enrichment and extend the traditional program. Others provide remediation and opportunity for credit recovery. The third type of Saturday school is used for disciplinary reasons.

Students enrolled in the first type of Saturday school tend to be those that are higher achieving and the courses are often used for enrichment purposes. Churches, colleges and private vendors often offer these programs and they are fee based.

When public schools offer Saturday programs, they are most often designed for course or credit recovery, make-up work and/or disciplinary reasons.

While individual schools may collect local data about the success of such programs there is no common measure of their success. Several of the links included later in this brief take you to individual school programs that may provide some data about their success.

Another approach to supporting student success is to provide tutoring. Information on the characteristics of successful peer and one-on-one tutoring programs is abundant. Across studies, two key ideas emerged. First there is no one right approach for every student in every situation. Second, when learning is personalized, adequate growth happens (Aarons; Breakthrough Collaborative; National High School Alliance 2007).

Tutoring allows students to feel more at ease and comfortable asking questions, making mistakes and developing academic confidence. Aarons described a peer-tutoring program where tutors worked one hour after school and three hours on Saturdays. In 2006, there was a 97% pass rate by those who were tutored and in 2007; there was a 100% pass rate (2007).

Several benefits of being tutored have been identified. They include:

- usually make significant academic gains
- improved attendance
- contributes to social and cognitive development
- improves self-confidence and self-esteem
- better attitude towards the subject and school
- encourages persistence
- develops appropriate study skills, questions and transferable skills

Similarly, benefits for the tutor have also been identified. They include:

- helps with personal knowledge
- improves grades
- practices high levels of thinking
- increases confidence in their own ability
- encourages empathy for others
- encourages responsibility (Walker, 2010)

Research Methods

Research design.

The research design is test scores from five students (two boys and three girls) who have scores that are on the bubble. This means with a little extra help, they can advance to another efficiency level. A survey was conducted with 137 families. The parents and students from the same household were surveyed to determine the time frame for the tutoring.

The independent variable used was the five students and the dependent variables were the EOC exam scores for Algebra II and American Government.

Data collection and Instrumentation.

The data was collected and extrapolated using the ASP software. In this analysis, five students were selected to investigate if their test scores before and after tutoring sessions helped to raise scores on mandated state test for American Government. An explanation of the status is as follows: Status 1 represents the test scores of the five students before tutoring and Status 2 represents the post-test scores of the five students after tutoring. The alpha level adopted was 0.25.

Each student met after school with his or her assigned tutor two times per week in the designated tutoring area for approximately two hours per session. The student shared with the tutor his or her assignment(s), and the tutor applied strategic tutoring methods and taught strategies appropriate for the assignment. Tutoring lasted 4 to 12 weeks, (January to March 2011) depending on the student's assignments and weather conditions.

Statistical analysis methods to be used

A t-test was conducted to test the hypotheses between the scores before tutoring and the final scores. The data was collected and extrapolated using the ASP software. In this analysis,

five students were selected to investigate if their test scores before and after tutoring sessions helped to raise scores on mandated state test for Algebra II. An explanation of the status is as follows: Status 1 represents the test scores of the five students before tutoring and Status 2 represents the post-test scores of the five students after tutoring. The alpha level adopted was 0.25.

The results of the survey were analyzed using a descriptive analysis.

Study group description.

Twelve students who were attending the tutoring were approached to solicit if they wanted to participate in a research study. Only five juniors responded and gave their consent to be included in the research. The group consisted of five students (two boys and three girls) who met the criteria of being a “bubble” student.

Data collection and instrumentation.

Archived data from the school’s recordkeeping system. This information included the dependent variable and the independent variables to validate the hypothesis.

Statistical analysis methods.

A t-test was conducted to find if there was a significant difference in EOC test scores for Algebra II and American Government after tutoring occurred. The mean, mean D, t-test, df, and p-value were concluded from this test. The Alpha level was set at 0.25 to test the null hypothesis: There is no significant difference in test scores after tutoring.

Findings

A survey was given to 137 parents who attended an event at the school and completed the survey with the following results.

The illustrations below represent the survey data.

1. Saturday School Survey: Due to low achievement levels on high-stakes assessments and a high failure rate in academic classes, this school is considering offering Saturday School from 8 – 11: 45 a.m. to provide tutoring in Mathematics and Communication Arts. Transportation will be provided. Would you be interested in your student attending this session?

Results	Yes	No	Maybe	N/A
Parents	31%	4%	16%	515
Students	17%	64%	19%	

1. After School Tutoring Survey: Due to low achievement levels on high-stakes assessments and a high failure rate in academic classes, this school is considering offering tutoring after school from 4 – 6 p.m. to provide tutoring in Mathematics and Communication Arts. Transportation will be provided. Would you be interested in your student attending this session?

Results	Yes	No	Maybe
Parents	56%	14%	30%
Students	84%	5%	11%

2. Lunch Time Tutoring Survey: Due to low achievement levels on high-stakes assessments and a high failure rate in academic classes, this school is considering offering tutoring during lunch time to provide tutoring in Mathematics and Communication Arts. You can bring your lunch to the designated rooms used for tutoring. Would you be interested in your student attending this session?

Results	Yes	No	Maybe
Parents	78%	4%	18%
Students	55%	37%	8%

Based on the results, the administration team, instructional coaches and tutors decided to hold tutoring sessions during lunch for middle school (grades 7-8) and after school for high school grades (9-12).

The school district has determined criteria for the categories and percentages. The following table illustrates the percentages and categories of achievement level placement.

Test Score Category Indicators and Percentages

Category	Percentage
Advanced	75 or higher
Proficient	55 or higher
Basic	30-50
Below Basic	Below 30

The following table illustrates the percentages of scores before and after the tutoring.

Student	Course	Score Before Tutoring - %	Score After Tutoring - %
Student 1	Algebra II	42.5	72.5
	American Government	75	97
Student 2	Algebra II	62.5	92
	American Government	60	68
Student 3	Algebra II	40	70
	American Government	28	48
Student 4	Algebra II	62.5	92
	American Government	23	32
Student 5	Algebra II	13	46
	American Government	71.4	98.9

Note: The archival data was obtained from the school's student record system.

The table illustrates the mean of the pre test scores is 44.1% and the mean of the post-test scores is 74.5%. The difference in mean was -30.4. The degree of freedom is 8, in many situations; the degrees of freedom are equal to the number of observations minus one.

After collecting and analyzing the data from the t-test, the p-value of 0.0407675 is less than the alpha level of 0.25. In conclusion, the null hypothesis must be rejected. By rejecting the null hypothesis, the data suggests there is a significant difference in the pre and post-test scores. Test scores did increase significantly after tutoring.

Source	Mean	Mean D	t-Test	df	p-value
X = Algebra II (Status 1)	44.1				
Y = Algebra II (Status 2)	74.5	-30.4	-2.4368	8	.0407675
Note: Significant when $p \leq 0.25$					

Status 1 = Pre Tutoring Status 2 = Post Tutoring

To determine if this was a significant difference, a t-test analysis was performed. The table below illustrates the mean of the pre test scores is 51.48% and the mean of the post-test scores is 68.78%. The difference in mean was -17.3. The p-value is 0.342294 and is greater than the alpha level of 0.25. The degree of freedom is 8, in many situations; the degrees of freedom are equal to the number of observations minus one. Based on the t-tests for American Government, there is evidence that tutoring made no difference in the test scores.

Source	Mean	Mean D	t-Test	df	p-value
X = Gov (Status 1)	51.48				
Y = Gov (Status 2)	68.78	-17.3	-1.00949	8	0.342294
Note: Significant when $p \leq 0.25$					

Status 1 = Pre Tutoring Status 2 = Post Tutoring

Conclusions and Recommendations

In conclusion, research shows that this review supported that tutoring was effective in improving the academic performance of five students in Algebra II and that there was no difference in their American Government scores after tutoring.

After collecting and analyzing the data from the Algebra II EOC exams t-test, the p-value of 0.0407675 is less than the alpha level of 0.25. In conclusion, the null hypothesis must be rejected. By rejecting the null hypothesis, the data suggests there is a significant difference in the pre and post-test EOC test scores for Algebra II. Test scores did increase significantly after tutoring.

After collecting and analyzing the data from the American Government EOC exams t-test, the p-value is 0.342294 and is greater than the alpha level of 0.25. Based on the t-tests for American Government, there is evidence that tutoring made no difference in the test scores.

Preliminary conclusions could be made that one-on-one teacher support would be more successful than traditional classroom teaching. In order to publish this report, the study would have to be developed into a much larger scale with more students. It is recommended to monitor the same type of tutoring at different school sites to see if the number of students makes a difference as well.

One of the main ways to identify the success of an after school or in house program is to compare the scores from students at the beginning and end of the school year. Examining the data helps teachers determine which students benefited from the tutoring program. Information from the scores of less successful students provides a good indicator of the areas teachers need to work on to help students improve their performance on standardized tests.

Additionally, researchers found that tutors could teach strategies during their tutoring sessions and those students could learn the strategies while they worked on their class assignments. Based on their final grades the students continued to be successful after tutoring ended, indicating that they were able to use the strategies they had learned.

In the current study, the use of certified teachers as tutors affected student performance in Algebra II due to the teacher-student relationship. The students in the study respected the knowledge of the teacher and were comfortable learning the material and sharing homework assignments. Each student was on the honor roll for the last semester of school. In support of this, next year (2011-2012) as seniors, they will continue to use the techniques and strategies learned to be successful as they prepare for post-secondary education.

Based on the findings, the recommendation for tutoring was to have retired teachers of core subjects (Communication Arts, Mathematics, Science and Social Studies) come in beginning in January until the end of March 2012, to tutor students to help them excel on their end of course assessments. Several retired teachers have been contacted who are willing to provide tutoring with or without payment.

In addition, several businesses have been contacted to investigate the availability of their staff to help us with our tutoring program. The responses have not been overwhelming from the business perspective because of the amount of downsizing that has occurred within their organizations.

Some students showed very large improvements and the correlation between their attendance of the tutoring and their success would need further study as well. Assuming that the attendance was the reason for improvement, the program has succeeded. The percent of improvement for tutoring American Government is significantly higher than the percent of

improvement from other types of interventions programs, but the consistency and validity would need to be evaluated with further research.

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