

The Effect of an After School Tutoring Program on Standardized Tests

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Submitted in Partial Fulfillment of the Requirements for the

Degree of Master of Education

May 2013

Graduate Programs in Education

Goucher College

Table of Contents

	i
List of Tables	
Abstract	ii
I. Introduction	1
Statement of the Problem	1
Hypothesis	2
Operational Definitions	2
II. Review of the Literature	3
Success in Middle School	3
Challenges to Success in Middle School	4
Interventions to Improve Success	7
Summary	10
III. Methods	11
Design	11
Participants	11
Instrument	11
Procedure	12
IV. Results	13
V. Discussion	15
Implications of Results	15
Threats to Validity	15
Complications to Previous Research	16
Implications for Future Research	16

List of Tables

1. Growth from Pre- to Posttests for the Experimental and Control Groups	13
2. Growth between Experimental and Control Groups	14
3. Impact of Number of Sessions Attended by Experimental Group Participants	14

Abstract

The purpose of this study was to determine whether an after school tutoring session had an impact on standardized test scores for 7th grade students. The study used a quasiexperimental pretest/posttest design to determine the effect of the tutoring class. The study began in January of 2013 and concluded in March of 2013. There was no statistically significant effect on test scores for the students who stayed for the after school tutoring sessions. Future research on this study could require below level students to attend the tutoring sessions and schedule those sessions during the scheduled school day.

CHAPTER I

INTRODUCTION

For most students, middle school is a challenging time, especially in the seventh grade. Seventh graders have graduated from being the babies of the school but are not yet the oldest in the school. During this time, parents give children more freedom and fewer rules. As far as academics, middle school mathematics can be among the most challenging of subjects for students. In seventh grade, an increasing amount of algebra is being introduced, and it is expected that students have mastered the prerequisites for this class.

Throughout middle school, students are often not on task during class which causes them to have major gaps in learning. When students fall behind, they often do not complete class work and homework assignments. Middle school students often find themselves in a struggle to fit in with the norm group of kids. Again, this causes them to fall even more behind.

In Maryland, one measure of middle school success is achievement on the Maryland School Assessments (MSAs). A particularly challenging aspect of student performance on the MSA is mathematics. Rothman and Henderson (2011) believe that a school-based tutoring program can significantly improve student performance in mathematics. Their research found that middle school students who stayed after school became more successful on standardized tests. By staying after school for the tutoring program, students were able to better learn important concepts and feel more confident when completing class work and homework assignments.

Statement of the Problem

The purpose of the study is to determine the effectiveness of an after school mathematics program on the success of students on the Maryland State Assessment.

Hypothesis

Students in the seventh grade who stay after school for the four-week tutoring class will perform the same on standardized tests when compared to students in the seventh grade who do not stay after school for the four-week tutoring class.

Operational Definitions

For the purposes of this paper, definitions are provided for the following terms which will be used throughout the paper:

MSA – Maryland State Assessment

After-School Tutoring Program – A four-week MSA review class

All other operational definitions can be found in Chapter III.

CHAPTER II

REVIEW OF THE LITERATURE

The literature review examines why students are not successful on standardized tests in middle school. The first section discusses how success is measured in middle school. The second section examines the challenges that can make it difficult to be successful in middle school. The third section investigates different interventions to give students a higher success rate.

Success in Middle School

Success in school is usually measured in two ways: test scores and grades. Tests can be broken down into two major categories, standardized and nonstandardized. “Standardized tests are administered and scored using fairly uniform standards” (Wiley, 2008, p. 431).

Nonstandardized or teacher-made tests are tests constructed by individual teachers. There are no standardized procedures in construction, administration, or scoring. In most cases, school-based student assessment exists in the form of classroom-level tests. These tests are usually administered at the end of a unit in order to measure what a student has learned.

An example of a standardized test which is gaining traction is called Measures of Academic Process (MAP). According to Cizek (2005), “The Measures of Academic Process are computer-adaptive tests designed to measure achievement of elementary and secondary school students in five areas: Reading, Language, Mathematics, General Science, and Science Concepts” (p. 18). The MAP tests are available for students in Grades 2 through 10. These tests are intended for English-speaking students in traditional school settings but can also be used for Spanish-speaking students or home-schooled students.

Cizek (2005) stated that a typical MAP test has approximately 40-50 multiple-choice items. For the secondary grades, the mathematics section is broken down into five sections: A-

Algebra, Patterns, and Functions, B-Geometry, C-Measurement, D-Statistics and Probability, and E-Number Relationships and Computation. Student scores can be represented numerically or with a cluster name. For each goal performance, students can receive a marking of low, low average, average, high average, or high. Based on this data, teachers can determine the successfulness of previous lessons and also use results to guide future instruction.

Another example of a standardized test is the Scholastic Aptitude Test, otherwise known as the SAT. This test is most often used as a basis to determine whether a student is prepared to attend a specific college, but it is sometimes administered to high-achieving middle schoolers as an aptitude test. The SAT is broken down into three specific sections: Writing, Math, and Critical Reading. Each section is worth of maximum of 800 points.

In addition to standardized tests such as the MAP and the SAT, another measure of success in middle school is grades. Students who earn straight A's in a semester have earned a 4.0 on the grade point average scale (GPA). Maintaining a high GPA can allow the student to earn certain incentives and recognition at school awards assemblies. *Engaging Schools* by the National Research Council (2004) indicates that some states require students to earn a specified grade point average in order to participate in certain extracurricular activities. Also, most colleges require students to provide transcripts detailing their previous academic performance, as measured by grades as well as their current GPA.

Challenges to Success in Middle School

The middle school transition can be very difficult for students. “This is unfortunate, because middle schools were designed in ways believed to soften the loss of teacher-student relationships typical of contained elementary school classrooms in which teachers are the caring and knowing adults” (Olson & McCaslin, 2008, p. 89). In middle school, students see several

teachers for a shorter amount of time. This is different from elementary schools where students may have only one teacher for the entire day. This difference in approach can create major anxiety for a child. Olson and McCaslin (2008) suggest that middle school students are expected to seek out attention from teachers who share their interests and academic strengths. In some ways, middle school students have not yet earned the privileges of adolescents but are no longer treated like children. According to Olson and McCaslin, “Social and cultural conceptions of youth in the middle years include puberty and puberty-related behaviors (e.g., mood swings, sexual interests), which unfortunately can negatively bias adult perceptions of them” (p. 90).

Another challenge that can occur in middle school is the difference in gender as it relates to motivation. Lundeberg and Mohan (2008) feel that boys and girls demonstrate different motives and interests for participating in school and academic activities. “Gender differences in academic motivation appear not only in students' general attitudes toward school, but also toward specific academic domains” (Lundeberg & Mohan, 2008, p. 288). Motivation can change based on the students' perceptions of their academic competency and interest in the academic tasks. According to Lundeberg and Mohan, “There can be many problems with making general statements about motivational differences because these are undoubtedly influenced by multiple contextual factors, including culture, home, and developmental age” (p. 288).

The next challenge addresses the interaction between the student and the teacher. “Because teaching and learning occur through interaction, educators have examined inequities existing in classroom discourse patterns that may contribute to gaps in achievement” (Lundeberg & Mohan, 2008, p. 292). Lundeberg and Mohan (2008) believe that middle school boys tend toward higher rates of misbehavior in school, so they often receive more praise and attention.

However, according to Lundeberg and Mohan, they are also more likely to be disciplined and sent out of the classroom.

Differential attention and interaction is also given to students, depending on ethnicity: African American boys are more likely to be disciplined and removed from classrooms, and students who have limited English proficiency are not called on as frequently during class discussions as English proficient students. (p. 292)

According to Lundeberg and Mohan, teachers give boys more feedback and encouragement when they talk. Females receive more individual instruction and attention than boys.

One final challenge at the middle school level pertains to the importance of friendship, not only throughout school, but also in life. The distinction between what makes a peer and what makes a friend changes as students develop. According to Burross (2008),

Younger students tend to socialize in larger, changing groups of geographically convenient peers who generally share the school days. These students define their friends as those with whom they amicably spend time, not always by choice. Oftentimes, these friends are the children of their parents' friends and are brought together because of age similarities for mutual entertainment during adult gatherings. Children define friends as those with whom they play or spend time. (p. 151)

Burross feels that change in the dynamics of relationships comes with age and maturity. Children begin to identify peers as friends or even “best friends.” Burross explains,

This is often a temporary title, based on a momentary kindness or shared event. The best friend is the person with whom the older child shares personal information. Reciprocal best friends have expectations from each other in terms of invitations and free-time activities. This exclusive relationship often results in hurt feelings among friends when

other people are given priority or with others when they are excluded. Best friends turned enemies can be the most dangerous kind, because previously shared information and experiences become fodder for mockery. (p. 151)

During the teen years, friendships slowly become stronger and grow over time.

“Friendships may also extend to sexual explorations with same-sex or other-sex significant others” (Burross, 2008, p. 151). If and when this happens, these can become difficult situations for the child both in and outside of school. “During this time, which is also marked by identity exploration, the adolescent is using friends and significant others to determine who they are and what they like and dislike in relationships” (Burross, 2008, p. 151).

Interventions to Improve Success

Rothman and Henderson (2011) believe that a school-based tutoring program can significantly improve student performance in mathematics. They conducted a study which used a pre/post, nonequivalent control group design to examine the impact of an in-district, after-school tutoring program on eighth grade students' standardized test scores in mathematics. Students who had scored in the near-passing range on the mathematics aspect of a standardized test at the end of seventh grade were recruited to receive tutoring. Thirty-seven participants (17 females, 20 males, aged 13 to 15) were randomly selected to serve as the control group. The ethnic breakdown was as follows: 8 Caucasian, 15 Latino, and 14 African American students. This tutoring program was conducted at the school and run by teachers who worked at the school. Rothman and Henderson stated that students had the most success when this was run at their current school and by familiar teachers. The results of this study indicate that lower-performing students benefited from this tutoring. The lower-performing students who received school-based

tutoring from district teachers performed higher on standardized tests in the areas of mathematics and language arts than other lower-performing students who did not participate in tutoring.

Another study addressed the use of computer-assisted instructional programs (CAI) to help improve mathematics achievement for a select group of eighth graders (Tienken & Maher, 2008). The computer-assisted programs were used to drill and practice newly-learned information. The idea was that students would be able to incorporate technology in the process of review. The CAI had a small positive effect on the overall mathematics achievement of 743 elementary and junior high school students studied. Students who participated gained 3.06 points on their Normal Curve Equivalent scores on a nationally normed standardized test of mathematics, as compared to students who did not have the CAI.

Main and O'Rourke (2011) feel that incorporating handheld game consoles which teach mathematical calculations can enhance mental mathematics. This intervention came about because they had reason to believe that

Students are: (1) not learning the basics of mathematics, nor are they being equipped for further study or future employment, (2) not performing well relative to other countries, (3) part of a long trail of underachievement in international tests, and (4) part of pockets of low achievement that reflect socio-economic, geographical, cultural and racial/ethnic factors. (p. 45)

Main and O'Rourke's study was quasiexperimental. One class conducted daily sessions using the handheld game consoles and the brain training software to enhance their mental math skills. The comparison class engaged in mental math lessons using a more traditional classroom approach. The students were assessed using standardized tests at the beginning and completion of the term.

Findings indicated that “students who were in the group which used the brain training software and the handheld game consoles showed significant improvement in both the speed and accuracy of their mathematical calculations and self-concept compared to students in the other control group” (Main & O’Rourke, 2011, p. 45). As such, Main and O’Rourke concluded that engagement plays biggest role in achievement in school during this crucial time in students’ lives. Without engagement, there is little possibility that students will make the classroom gains expected of them.

Another intervention conducted by Voorhis (2011) aimed to have more parent involvement pertaining to homework. According to Voorhis, “Research indicates that in addition to classroom instruction and students’ responses to class lessons, homework is one important factor that increases achievement” (p. 220). Voorhis suggests that homework requires students, teachers, and parents to dedicate time and effort on assignments. This study noted that 90% of teachers, students, and parents believe that homework will help students reach important goals.

In Voorhis’ (2011) study, the intervention was conducted to determine whether a Teacher Involve Parents in Schoolwork (TIPS) intervention improved standardized test scores. The TIPS intervention was applied to both elementary and middle school students. Each week students were given a homework assignment that involved a family member or someone in the community. For example, the assignment could be a discussion, interview, experiment, or another interaction. At the end of each school year, teachers were asked to look at homework completion. There was a noticeable positive change in homework completion over the course of the study. Students involved in the study were also given several questions to answer about the TIPS program. It was noted that during the intervention, students saw more reason behind giving homework and enjoyed working with family members.

One final reviewed intervention examined the effect of ongoing professional development for middle school mathematics teachers aimed at improving standardized test scores. Some of the professional development consisted of ways to teach certain lessons as well as how to incorporate technology into the classroom. The study was done in Colorado with 128 teachers from seven school districts. McMeeking, Orsi, and Cobb (2012) stated that this was a quasiexperimental design and used test scores to gauge results. Findings in the McMeeking et al. study included that “the odds of a student achieving a proficient or advanced score on the state test were then compared between cohorts. Results showed that student odds of achieving a score of proficient or better increased with teacher participation in the PD program” (p. 159).

Summary

The review of the literature has discussed how success is measured in middle school, the challenges that can make it difficult for a middle school student to be successful, and different intervention methods to improve student success at the middle school level. Teachers can use a variety of strategies to encourage student engagement and promote higher achievement levels. The research shows many different methods that have been proven to work.

CHAPTER III

METHODS

Design

This study used a quasiexperimental design to determine whether students who attended after school Maryland State Assessment review sessions would fare better on a practice MSA than students who did not attend review sessions. The subjects of the study included students at a specific school enrolled with a specific teacher. Students used a pretest/posttest method in order to determine the level of improvement. Since the sampling method did not include randomization, it was a quasiexperimental design.

Participants

Participants represented a sample of the 1,065 students enrolled in a public middle school in the suburbs of a large mid-Atlantic city. Of these 1,065 students, 346 are 7th graders. The school currently has 84.2% of students scoring proficient or advanced on the math MSA. The students in the experimental group were at 74% proficient or advanced, and the students in the control group were at 81% proficient or advanced. The experimental group consisted of 24 students who stayed after for the MSA review sessions. Of this group, 14 were White and 10 were African American. The control group consisted of the 68 students who did not stay after for the MSA review sessions but were in the same mathematics class. Of these 68 students, 35 were White, 27 were African American, 3 were Hispanic, and 3 were Asian. All students were primarily middle class.

Instrument

This study used a pretest/posttest method. For this study, the pretest and the posttest were taken from http://www.mdk12.org/instruction/curriculum/mathematics/assessments_msa.html.

The test included nine multiple choice, two brief constructed response, and one grid-in question. This test covered all of the objectives that are taught in seventh grade and will be included as test items on the MSA.

Procedure

The study began for both groups on January 31, 2013. At this time, all students took the same pretest which was then collected and graded by the instructor. Students who were absent this day were asked to take it the following school day. The control group consisted of all the students who were taught by the teacher but who did not attend the after school MSA classes. The treatment group consisted of the students who stayed after for MSA review classes. These classes were offered during the following four weeks. The students had the option to attend up to four MSA review classes. The review sessions lasted one hour, and data was collected on which students elected to stay. During this hour, a mini lesson was taught on a specific topic that was chosen by administration. The topics were operations involving decimals, equations with integers, geometry, and probability. After the MSA review classes were concluded, both groups took a posttest, which was the same test as the pretest. This posttest was then collected and scored by the instructor.

CHAPTER IV

RESULTS

This study was conducted to determine the effect of after school tutoring sessions on math achievement. Pre- and posttest data were gathered on the students. Two different data analyses were performed. The first analysis was an independent t test to determine whether there were significant differences between the experimental and control groups. Table 1 presents measures of central tendency for the experimental and control groups, and Table 2 presents independent t test results for the experimental and control groups. Table 3 presents the results of a chi square analysis to determine whether the number of sessions attended by the experimental group made a difference in the growth. No significant differences were found for growth between groups. There were no significant differences found for growth as compared to the number of sessions attended in the experimental group.

Table 1

Means and Standard Deviations for Growth from Pre- to Posttests for the Experimental and Control Groups

	Group	N	Mean	Std. Deviation
Growth	Control	71	3.8592	2.86504
	Experimental	24	3.9583	2.51049

Table 2

Independent t Test Results for Growth between Experimental and Control Groups

		t	df	Sig. (2-tailed)	Mean Difference
Growth	Equal variances assumed	-.151	93	.880	-.09918
	Equal variances not assumed	-.161	44.853	.873	-.09918

Table 3

Chi Square Analysis on the Impact of Number of Sessions Attended by Experimental Group Participants

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	24.476 ^a	27	.604
N of Valid Cases	24		

CHAPTER V

DISCUSSION

This study examined the impact of an after-school tutoring program on student performance on a standardized math examination. The null hypothesis that students in the seventh grade who stayed after school for the four-week tutoring class would perform better on standardized tests when compared to students in the seventh grade who did not stay after school for the four-week tutoring class was retained. Data analysis in chapter IV indicated that the null hypothesis was retained.

Implications of Results

In this experiment, there was no effect on test scores for the students who stayed for the after-school tutoring sessions. The results displayed in the data table show no significant difference in scores for either group.

Threats to Validity

A threat to external validity is the fact that students determined whether or not they wanted to be part of the treatment group. The entire 7th grade was given the opportunity to stay after school, but only those who filled out the permission slip stayed after. When self selection occurred, it limited the ability to generalize.

A threat to internal validity is mortality. The observer noticed throughout the study that the number of students attending the afterschool program changed each week. This was due to other after school commitments as well as the inability of some students to secure transportation home on any given day.

An additional threat to internal validity was that the students matured intellectually over time. This means that after the students took the pretest, they were going to learn more

information throughout the following weeks in class regardless of whether or not they stayed for the after-school tutoring program. This would cause both the nontreatment and treatment group members to improve scores.

Another internal threat to validity was the time of the day that the tutoring group was held. For convenience reasons, this tutoring program was held after school. Had the tutoring program taken place during the school day or before school, results may have differed.

Comparisons to Previous Research

The current study is similar to Rothman and Henderson's (2011) work. Rothman and Henderson felt that a school-based tutoring program could significantly improve student performance in mathematics. Their study consisted of using a pretest and posttest to determine whether students' mathematics scores increased on a standardized test. However, their tutoring classes lasted much longer than four weeks. In fact, some students were in the tutoring class for the entire year. The results for this particular study indicated that the lower performing students showed significant gains when they consistently participated in the tutoring program.

Implications for Future Research

Results from the current study showed that staying after school for a tutoring program had no effect on standardized test scores. It would be beneficial to determine whether extending the length of the tutoring program would have a positive impact on students' posttest scores. Extending the program may give students more time to practice their skills and better learn the concepts.

For future studies, it is suggested that a different posttest be administered. Since this posttest was only taken five weeks after the pretest, some students may have memorized the

answers. It would be important to still cover the same topics on each test, but modifying the problems slightly by using different numbers could easily address this challenge.

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