

The Relationship Between In Class Assignments and Homework Assignments on Student

Achievement in 8th Grade Math Classes

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Abstract

The purpose of this study was to determine the relationship between in class assignments and homework assignments on student achievement in 8th grade math classes. The sample consisted of 22 male and 10 female 8th grade math students at T. A. Dugger Middle School in Elizabethton, TN. Data were collected using Power School computer based assessments. The students were administered a test after being taught a unit on congruence in geometry where class time was given to complete an individual assignment which was graded for participation. Next, the students were tested after being taught a unit on similarity in geometry where no class time was given for an individual assignment but instead sent home for homework. The assignment was then graded for correctness. The data were analyzed using paired samples T-tests. The results indicated no significant difference between the in class and homework assignments ($t(31)=1.038, P>.05$). Similarly, there was no significant difference between IEP student performance on academic achievement ($t(11)=0.603, P>.05$). The results suggest the type of grading and setting on the assignment may not have as much effect on student achievement as previously thought.

Keywords: Homework, grading, in-class assignment, participation grade, special education



Institutional Review Board Decision Tree

Based on your responses, you do not need approval from the IRB.

It looks like your research is exempt because it is educational research.



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Chapter 1

Introduction

Homework has been used for centuries as a tool to stretch the classroom into the after school life of every student. Homework remains a staple for most classes although its benefits have always been debated and studied and its use in the classroom ebbs and flows. In our current climate of closing our national academic performance gap and tying student achievement to teacher evaluations and even pay; squeezing the most performance out of students is more apt than ever (Lavy, 2007). This study focuses on how to make the best use out of the valuable time we are given with students every day. Teachers have the option to lecture, create and implement group or individual discovery activities or projects, facilitate discussions, etc. The list is endless. I fear that because it can be done at home, individual work on problems has been relegated to homework because it was not deemed the best use of a teacher's time and it is one of the few teaching tools that can be moved to homework. Math, more so than any other common subject requires practice for learning. Even with Common Core emphasis on problem solving and synthesis of knowledge as opposed to traditional answer calculation and basic skill display practice of working problems to completion is critical to math achievement. There is no greater skill in math than persevering through a problem using only your brain, pencil and paper. Such an important skill cannot be relegated to students hopefully picking it up at home. Parents, especially those from low income households, are skittish about engaging with math homework material (O'Sullivan, Yunk-Chi, & Fish, 2014). This may be exacerbated by Common Core methodology, which can teach even basic math computations differently than parents learned. Socio economic status is a high indicator of parental involvement in homework. However, at the

opposite end of the spectrum are helicopter parents who are over involved and can end up doing more harm than good. Teachers should not only teach individual problem solving, but observe and facilitate this in the classroom. Spending time in the classroom on individual problem solving by no means infers relegating the teacher to shuffling papers at their desk. Contrarily, teachers should wear themselves out moving from desk to desk observing, prompting, scaffolding, questioning, encouraging, correcting, etc. to provide a personal tutoring experience for those students in need and gathering formative data for use in subsequent interactions. What each student needs is different for every problem. Parents are not professional educators and can't be expected to know when a student needs to persevere alone with the knowledge they have, when they need scaffolding, and what foundational knowledge may be lacking. Individual problem solving is too valuable a skill to hope all our parents can teach it at home. Our common core initiative is on problem solving and critical thinking, and there is no better way to practice and sharpen these skills than individual problem solving. On the other hand, homework provides students an opportunity to learn the life study habits and skills as well as enhanced learning and reinforcing what is learned that day (Deveci & Onder, 2015).

Statement of the Problem

Homework has many advantages and disadvantages in a school environment and these vary based on grade level and other factors. Homework can provide character building benefits to students and can be a way to extend time spend on school work into after school hours. On the other hand, homework takes away from equally important social and home events and atmosphere's and can have adverse effects on the student's perception of math, especially lower performing students. Dealing with homework related administration can also become a drain on

a class and teacher's time. Therefore, the problem of this study was to investigate whether it was more beneficial to student's academic achievement to take class time to grade and take questions on the previous night's homework, or use that class time instead to have students work on that assignment in class with the teacher available for individual questions.

Purpose

The purpose of this study was to assess the relationship between in class assignments and homework assignments on student achievement in 8th grade math classes.

Significance of the Study

Teachers are given only a limited amount of time to interact with their students on a daily basis and once a student leaves the teacher's class for the day the teacher no longer has control over that student's learning. At higher levels this may be a good thing; after all we want to develop lifelong learners. However, a supportive environment for concentration at home may not be available in light of the hectic pace of modern families and varied home lives of students. Additionally, for students to receive the most benefit from homework they must know if they are correct, and unless graded, student motivation for working at home is low. This leads to two options in most traditional middle schools without 1 to 1 student to computer ratios: 1) A teacher must take time in class to go over and grade homework answers, or 2) the teacher must give students time to do the work under observation to ensure the appropriate techniques and effort is

used. This study seeks to determine which of these two techniques produces better student achievement.

Limitations

There were some limitations to this study:

1. The researcher was relying on tests from Powerschool which while professionally done were not tested for reliability or validity.
2. The sample came from one class that was not randomly selected and therefore results may not be generalizable to other populations.

Definition of Terms

1. Homework- Any work done outside of the regularly scheduled class.
2. Achievement- Determined in this study by Powerschool standards based tests.
3. In class assignment- an assignment given during class which can reasonably be expected to be finished during class.
4. Completion or participation grade- grading criteria are; finishing all problems, following all directions, and showing all work. Accuracy of answers is not taken into account.

Overview

This study contains five chapters. Chapter one includes the introduction, problem statement, purpose statement, significance, limitations, definitions, and overview of the study. Chapter two contains the review of literature. Chapter three contains methodology and

procedures, population, sample, data collection instruments, procedures, research questions and related hypotheses. Chapter four covers data analysis and collection of data. Chapter five includes a summary of findings, conclusions, recommendations, and implications of this study.

Chapter 2

Literature Review

Little research on the difference between homework and allowing students class time to complete the same assignment in-class has been undertaken. However, it will be helpful to frame this research question with other research completed on various aspects of the problem identified. The problem is deciding whether it is better to send students home with homework that is then graded in class or taking time in class to do that same assignment but only grade for completion or ‘participation’. Pertinent background research can be divided up to answer several underlying questions. Why is independent work important in math? Why do we grade students’ work? What are the reasons for and against giving homework? Why work in Class? Exploration into research on these topics will help frame the importance and relevance of the research question in front of us.

WHY INDEPENDENT WORK?

Finding ways to engage students to do their best work, learn the most and make the best use of class time is the focus of teachers. There are many ways to spend time in the classroom. The examples are endless but typical uses of class time are; chalkboard instruction, groupwork and individual assignments. Yetter and Gutkin (2006) conducted a study in which individual problem solving practice was compared to unstructured group practice. The results “suggest that it is inadvisable to assume that collaborative practice will be as effective as individual practice for promoting complex problem-solving skills” (p.152) Although they cited Dees (1991) and Springer, Stanne, & Donovan (1999) as stating that peer collaboration to be at least as effective

as individual practice for enhancing complex problem solving skills, Yetter and Gutkin found just the opposite to be true in their experiment despite attempting to prove a hypothesis in favor of group work. The question then is not which is better, but more aptly when is the appropriate time to use both tools? A strong study in favor of individual practice for math problem solving comes from Manu Kapur in his study on ‘productive failure’. His study was focused solely on individual work; comparing a traditional lecture and assignment method with his productive failure method in which students are given a problem to solve individually, but only minimal instruction or problem framing beforehand. Although his productive failure class was unable to solve the problems, their persistence in problem solving (arguably the most important trait of a math student) was greatly enhanced and students performed better on the posttest than did the control group (Kapur, 2010). This study is significant in that this monitored and controlled ‘productive failure’ would be impossible to set-up and control outside of the classroom. This form of individual problem solving can only be implemented by a teacher in the classroom and adds evidence to the argument in favor of using class time for individual assignments where the teacher can control time spent on problems and amount of instruction or scaffolding on that problem to encourage productive failure and perseverance.

HOMEWORK SHORTCOMINGS

Homework has long been used in schools to extend the time spend on a subject outside of the class meeting. The popularity of homework has ebbed and flowed over the history of public education, and its usefulness in balance with the time it takes from other activities make it

continually contested. In a study conducted by O'Sullivan, Yung-Chi Chen & Fish (2014) low income parental involvement in math homework was studied. The findings showed that low income parents were much more likely to want to provide the setting and structure for their student to complete their homework than they were to engage the material themselves. Ndebele (2015) supported this finding stating that; "Findings suggest that the higher the income and socio-economic status, the more parents are likely to become involved, whereas parents from a poorer socio-economic background are less likely to be involved in their children's homework" (p.72). If we are striving for equal access for all of our students can we send them home with work knowing there is a wide disparity in the support they receive at home? On the other end of the spectrum is a study from Locke, Kavanagh, & Campbell (2016) citing parenting experts Padilla-Walker & Nelson (2012) on parental overinvolvement with children's homework. Overinvolvement can hurt a child's autonomy and personal responsibility for their grades as well as being a source of conflict between parents and children. Helicopter parents are more likely to over-help or give students answers thus short circuiting the problem solving practice and perseverance that teachers try so hard to instill.

Cheema & Sheridan (2015) found that math anxiety and time spend on Math homework are two important predictors of math achievement. "In context of schoolwork, anxiety is the feeling of helplessness, tension, and/or psychological distress that occurs when a student finds it difficult to cope with the said schoolwork" (p.247). As math anxiety increases, achievement decreases. Also, as time spent on homework increases; achievement increases. It lends that math anxiety can be counterbalanced by an increase in time spent on homework or classwork since a better grasp on the material regardless of how the knowledge is attained should decrease anxiety.

Also, having students complete assignments in-class should provide some comfort for low students who know they will not get the same math support at home as they will from their teacher in class. The assumption is that a quality professional teacher will be able to offer the appropriate amount of support to each individual student, using scaffolding and differentiation techniques to engage each student where they are at. This should reduce anxiety. Also, the assumption is that the class size is low enough and the level of student math achievement is diverse enough that one teacher can answer all questions as they arise during individual problem solving time as well as effectively monitor ALL students for on task behavior, correct technique, and feedback on the accuracy of solutions and student mistakes. Of course the teacher must provide a safe distraction free work environment for the students. These are the elements that differentiate class work from homework. If these conditions cannot be met, the only difference between the classwork and homework is the location and the purpose of this study is moot.

Devevi and Onder (2015) conducted a study on the views of middle school students on science homework. As one might expect students who normally spent their leisure time at home watching TV or playing computer and video games viewed homework more negatively, and students who preferred reading books in their non school time viewed homework more favorably. Also, students who spend more time on homework viewed it more favorably. It makes sense that those students who enjoy academic activities like reading would like homework, and of course those students who put time and effort into their homework will appreciate it more. However, this perpetuates the problem that those students who are ‘good at school’ do well, while those who do not conform as well to its demands of sitting still and completing

assignments on time struggle even though they may be equally smart . Despite its implementation difficulty in our public school setting designed for efficiency and batch-teaching students we need to move towards a school model that seeks to reach all students where they are at and try less to cram students into the ‘public school system mold’ while leaving those who don’t fit to not reach their full potential and feel they are inferior. This is reinforced by the final finding of this study that girls have a more favorable view to homework than boys. Speaking in generalities boys are active and interactive than girls. Sitting down to complete an assignment after sitting still in school all day is adding insult to injury. Second, middle school girls are more mature than their male classmates so making the mental connection between time spent on homework, good grades, and better future opportunities happens more naturally.. For better or worse this is the current model for suitable progression based on how our education system meshes with most employers.

Galloway, Conner & Pope (2013) completed a fascinating study of high schools in upper middle class suburbs. Their findings showed that homework was viewed as high quantity, low quality assignments given as a perpetuation of the status quo that homework is ‘just good practice’ and expected in a rigorous academic environment and did little to actually improve the student’s understanding or academic success.

In some ways, homework practices in these schools present a paradox. The students in our study were from advantaged communities. The schools these students attended, and the majority of the students themselves, are considered to be successful by current measures of achievement, and most will benefit from their school contexts (including the achievement pressure and the hours of homework) by garnering acceptance to college.

During their secondary school years, students develop many of the skills required to advance in a competitive, achievement-focused society... In this way, current homework practices may act to further the class divide in our educational system. However, our study indicates that the benefits of homework to these advantaged students can be coupled with significant costs, and our current homework practices seem to be serving few students well...young people are spending more time alone, which means less time for family and fewer opportunities to engage in their community. Moreover, the focus on grades over learning and the underlying pressure for students to compete for and maintain their status “may result in an attitude that ignores community interests and places a priority on personal concerns..., and instead suggest that researchers, practitioners, students, and parents unpack why the default practice of assigning heavy homework loads exists, in the face of evidence of its negative effects. (p.506)

HOMEWORK BENEFITS

As a counterpoint, in her article, *The Motivational Benefits of Homework: A Social-Cognitive Perspective*, Janine Bempechat states that “homework plays a critical, long-term role in the development of children’s achievement motivation. More specifically, homework assignments provide children with the time and experience they need to develop beliefs about achievement and study habits that are helpful for learning, including the value of effort and the ability to cope with mistakes and difficulty” (Bempechat, 2004, p.189). This research is paired with that of others who suggest that homework does much good and its effectiveness is dependent on nuances such as purpose of the assignment, length and rigor of the

assignment, ability of the student to complete it independently while being rigorous enough to keep the student's interest, and appropriate parental involvement Marzano and Pickering (2007).

This sampling of studies get to the heart of what homework should and shouldn't be for.

Educators are constantly under pressure from forces external to their classroom. Parents, voters, administrators, as well as state and national education officials all have their own ideas on how students should be taught and specifically in this case, how much homework is enough and how much is too much. What is most important is that educators know their material, students and relevant body of research to be able to confidently create and defend their classroom's homework policy.

CLASSWORK

What effect does having immediate feedback and appropriate scaffolding during independent assignments have on students' achievement? According to Kodippili (2008) and Mendicino (2009) students that were assigned computer based homework that provided immediate feedback of answers and appropriate scaffolding earned significantly higher success scores than their peers in the the control group of pencil and paper homework graded by the instructor and gone over the next day. This is an important finding, but what if your students or schools are not privileged to ensure computer access to all students? Is the inferior standard pencil and paper homework method their sad relegation? Our current research problem can be most appropriately applied here. Without guaranteed computer access at home or school the teacher can provide immediate feedback in the form of answers given and mistakes pointed out and explained (or not, as might be deemed best initially) and scaffolding provided for still

struggling students on a student to student and a problem to problem basis. However, for the teacher to fill the role of the computer in these studies for immediate feedback and scaffolding the students must be given time to engage in this individual problem solving assignment in their math class with an engaged teacher.

Here also we can return again to the issue of math anxiety. Harper and Daane (1998) quote; “students have often felt under pressure to do math in an allotted amount of time and to do it the "right" way. There has been undue teacher emphasis on tests and grades that has produced much anxiety in students” (p.37).

A teacher can reduce this time constraint induced anxiety by giving class time to students for work on practice problems but allowing students to finish assignments at home if needed. Also, with no time left in class to grade these assignments even the most dedicated teachers would break under the load of 15-30 papers to grade for correctness per class. The obvious result is to grade for completion and effort, which can be completed much quicker and results in a double bonus of reducing the emphasis on grades that cause math anxiety. Another perceived benefit of giving students time in class to complete their assignment is that they can immediately apply what they have just learned in class. This acting out of their knowledge should help transfer this new information from their short term to longer term memory. If the lesson wraps up at the bell without time for classwork on the new material, it could be twelve hours later or longer until a student has the opportunity to put their new knowledge into practice.

CONCLUSION

In this review of literature we have converted many topic associated with our research question of whether it is better to have students complete an assignment at home or in class. First we looked at why independent work is so important in mathematics. Students learn through productive failure of grinding through problems learning how to use what they know to explore solutions and learn to problem solve. This process can be short circuited by over-helping parents or by inadequate home situations that do not provide any support or setting for individual work. Next, we looked at the shortcomings of homework in the context of math anxiety it can create as well as how unhelpful homework not only kills student motivation, but reduces time for other tasks necessary to healthy human living such as getting enough sleep, family and community involvement, and hobbies and interests outside of school. On the other hand, we explored research on the benefits of homework. Specifically, that homework was a tool to extend the classroom and allow students to grow individually in their study habits and task completion and delayed gratification practice. We found it came down to how well the assignments were created and the specific material as well as the goals of all those involved as to whether homework was beneficial or not. Lastly, we looked at classwork and how the immediate feedback and scaffolding that has proved to be so helpful in computer based homework can be replicated in class work by allowing the teacher to provide immediate feedback and scaffolding on a student by student basis.

Chapter 3

Methodology and Procedures

Population

The population for this study came from T.A. Dugger Junior High School in Elizabethton, TN. There were 583 students attending the school, 6% Black or African American and 94% White. The school serves grades 6-8. 52% of students were economically disadvantaged.

Sample

The sample of this study consisted of two classes in the 8th grade totaling 45 students. There were 23 males and 22 females. Students ages ranged from 13 to 14 years old. One class was a special education inclusion class with 14 students with IEPs. The classes are taught identical material and standards with scaffolding and differentiation appropriate to the specific class population. The sample was not selected randomly, but from convenience.

Data Collection

The data was collected for this research using two professionally made tests specifically for the standards covered. PowerSchool assessments were used for their uniformity, consistency and delivery method. Both tests were administered via computer. Two modules were chosen for their similar level of difficulty and perceived interest to the students. Each module required approximately a week and a half to cover the material and a day of review. The assessment was given following the review.

Procedure

Before research was conducted, permission was obtained from the Milligan College IB and the school where the study took place. After all permission was granted the sample was selected and study was implemented. Two modules equal in difficulty were selected for the study. The first module was taught using quasi lecture delivery with 'I do, we do, you do' the first half of the block class, while the second half was reserved for a block of independent practice on an assignment from the textbook or worksheet. Enough time was given in class for the average student working diligently to complete in class. However, students were required to finish the assignment at home if they were unable to complete it in class. The teacher was active in circulating about the class while the students worked independently answering questions, checking student progress and comprehension, and spot checking specific problems for accuracy. The teacher checked over the work of students who finished early for accuracy and gave feedback to the student for corrections. Homework was collected at the beginning of class the following day and graded by the teacher outside of class for effort. (ie: completion, following directions, and showing any applicable work) No answers were graded for accuracy.

The second module was also taught using traditional quasi lecture delivery in the 'i do, we do, you do' format with textbook homework assigned overnight with the answers graded by peers for accuracy and homework questions answered by the teacher the following class day. In the two differing methods, class time devoted to grading and answering homework questions in the second method was comparable to the time given to students to complete the assignment during class in the first method. All other use of class time was identical. In both methods, grades

taken on assignments contributed to 70% of the students' grades for the class and the Module quizzes used for data collection were part of the students' quiz average that contributed 20% of the students' overall grade for the class. Over half of the answers were available to students in the back of the book for the assignments in both methods.

Research Questions and Related Hypotheses

Research Question 1: Is there a difference between students' performance when they are given time to complete homework in class and graded for participation or when no class time is given for homework and graded for correctness?

Research Hypothesis 1: There is a difference between students' performance when they are given time to complete homework in class and also graded for participation and when no class time is given for homework and also graded for correctness.

Null Hypothesis 1: There is no difference between students' performance when they are given time to complete homework in class and also graded for participation and when no class time is given and also graded for correctness.

Research Question 2: Is there a difference in the number of assigned questions students complete when they are given class time to work on them and when they must do them at home?

Research Hypothesis 2: There is a difference in the number of assigned questions students complete when they are given class time to work on them and when they must do them at home.

Null Hypothesis 2: There is no difference in the number of assigned questions students complete when they are given class time to work on them and when they must do them at home?

Chapter 4

Data Analysis

The purpose of this study was to determine the relationship between homework assignments graded for correctness and class assignments graded for completion on achievement in a middle school math class. Two modules were taught over the course of several weeks using these two assignment methods.

Collection of Data

Data were collected by using two Power School assessments administered via desktop computer. For the research a transformational geometry unit was used. The module on congruency was used for in-class assignments graded for participation and the module on similarity was used for homework assignments graded for correctness. A test was administered at the end of each of these modules. Instruction per module was approximately 7 classes or 10.5 hours. The results of the first module was compared to the second module. The demographic profile of the students is displayed in Table 1. Students were categorized as male and female as well as having an IEP or not.

Table 1

Demographic Profile of Students

Group	Frequency(f)	Percent(%)
Male	22	68.80
Female	10	31.20
IEP	11	34.40
Non IEP	21	65.60
Total	32	100.00

Research Questions and Related Hypotheses

Research Question 1: Is there a difference between students' performance when they are given time to complete homework in class and graded for participation and when no class time is given for homework and graded for correctness?

Research Hypothesis 1: There is a difference between students' performance when they are given time to complete homework in class and also graded for participation and when no class time is given for homework and also graded for correctness.

A paired Samples T-test was calculated comparing the mean scores of in-class/ participation and homework/correctness. The mean for in class assignment was 75.1 and the mean score for homework was 71.9. To determine whether the mean difference was significant, t-test for paired samples was conducted. The results indicate no significant difference ($t(31)=1.038, P>.05$). The means for in class assignments ($M=75.13, sd 18.28$) were not

significantly different from the means for homework (M=71.88, sd= 20.7). Therefore, the null hypothesis was retained. The results are displayed in Table 2.

Table 2

Paired Samples t-test for In-Class/participation and Homework/graded Methods Scores

Homework type	M	Sd	df	t value	Sig
Participation in class	75.13	18.28	31	1.038	.307
Accuracy / homework	71.88	20.70			

Note: $p > .05$

Research Question 2: Is there a difference between IEP students’ performance when they are given time to complete homework in class and graded for participation or when no class time is given for homework and graded for correctness?

Research Hypothesis 2: There is a difference between IEP students’ performance when they are given time to complete homework in class and also graded for participation and when no class time is given for homework and also graded for correctness.

To answer research question two a paired Samples T-test was calculated for IEP students comparing the mean scores of in-class/ participation and homework/correctness for these students. The mean for in class assignment was 63.5 and the mean score for homework was 59.1. To determine whether the mean difference was significant, t-test for paired samples was

conducted. The results indicate no significant difference ($t_{10}=0.603$, $P>.05$). The means for in class assignments ($M=63.5$, sd 18.7) were not significantly different from the means for homework ($M=59.1$, $sd=$ 22.6). Therefore, the null hypothesis was retained. The results are displayed in Table 3.

Table 3

Paired Samples t-test for In-Class/participation and Homework/graded Methods Scores for IEP students.

Homework type	M	Sd	df	t value	Sig
Participation in class	63.55	18.73	10	0.603	.560
Accuracy / homework	59.09	22.56			

Note: $p>.05$

Chapter 5

Summary of Findings, Recommendations, and Implications

This chapter includes a summary of findings, recommendations, and implication of the research conducted to determine the effects of using class time for assignments and grading for participation or sending the assignment home but grading it for correctness.

Summary of Findings

In regard to Research Question #1; is there a difference between students' performance when they are given time to complete homework in class and graded for participation or when no class time is given for homework and graded for correctness? A paired samples t-test revealed no significant difference between the two situations ($t(31)=1.038, P>.05$). Therefore, the null hypothesis was retained.

Based on my observations, the results were not significant for several factors. First, tendencies of students when working on in- class assignments was to work to ensure the assignment was completed in-class and did not have to be taken home to complete. The teacher did field some questions, but only to finish the assignment faster. It seemed that the more in-depth the teacher's discussion with the students with questions, student were reluctant to ask more for fear of wasting time. Also, it takes self-confidence above what many 8th graders possess to stand out from your peers by asking a question while everyone else is working quietly. This was true for both IEP and non-IEP students, although for IEP student the tendency to rush and not ask questions was exacerbated because wrong answers are generally expected by them and not as worthy of concern. Also, the mental ability to take time thinking about critical

thinking questions is less. The teacher attempted to minimize these trends by not waiting for questions, but being proactive in checking student work, pointing out wrong answers, and engaging in individual discussion to check understanding. Students appreciated the time in class to work on the assignment and the mood stayed lighter since the stress of getting a correct answer was gone during the first chapter. There were many additional unknowns when students took their work home. Were they understanding the material? Were they thinking critically? Were they getting enough help, or too much? Did they just copy from a friend before school? The potential is also there for great individual effort and perseverance in problem solving, but the researcher believes these are the exceptions.

In regard to Research Question #2, is there a difference between IEP students' performance when they are given time to complete homework in class and graded for participation or when no class time is given for homework and graded for correctness? The results again indicated no significant difference between the two methods ($t(11)=0.603, P>.05$). Therefore, the null hypothesis was retained.

Students with IEPs were part of an inclusion class with a strong majority being special education students. IEP students generally have less success in math and therefore, lower motivation, a poor perception of math as 'impossible', and struggle with feeling intellectually inferior to their regular education peers. The researcher expected to see a much greater jump in learning for these students when effort was rewarded over correctness in the chapter graded for participation. By and large these students have less home support as well, which would again point to better scores when all learning was contained in the classroom. Surprisingly, the slight

difference in median scores was about the same for special education students as it was for regular education students.

The results were not consistent with Cheema & Sheridan (2015) who found that achievement increases with time spent on homework. Students appreciated having their time outside of school respected and many learning factors outside of the teacher's control were eliminated. Students' math perceptions and motivation was observed to increase when effort was prioritized over correctness.

Conclusions

The purpose of this study was to determine if there was a difference between two classroom models; 1) giving students time in class to complete an individual assignment graded for participation, or 2) giving the same assignment as homework and grading it for accuracy. A paired samples t-test revealed no significant difference between the two situations. Students performed about the same on their summative assessment regardless of the homework/grading situation. Another paired samples t-test revealed the same conclusion held true specifically for students with IEPs. Therefore, the inference can be made that there is little to no benefit to allowing students time to complete individual assignments in class and grading for participation.

Recommendations

1. This study should be repeated with a random sample taken from several schools. Having a larger sample population will validate the results of this study.

2. Further research should focus in on classwork versus homework and grading for correctness versus participation individually to determine if either have an effect on student achievement.
3. This study should be repeated in other areas of mathematics, such as algebra or different content areas to determine if different results could be realized.

Implications

Math is a difficult concept for many students, and the common core push for critical thinking and problem solving has set the bar higher than expectations and assumptions many students have developed about math. The following implications of this research are as follows.

1. The amount of homework given might have less of an impact on student achievement than commonly thought. Although this study did not find significant results on in class and homework assignments, Cheema & Sheridan (2015) found that there is a correlation between homework and achievement, therefore, teachers should still consider homework as a tool for learning and students should be encouraged to embrace the assignments and refrain from seeking unnecessary assistance from peers or parents.
2. It is easy to grade math problems for correctness since there is commonly a single correct answer. However, grading for student participation (effort and completion) may be just as effective if not more so. Given the prevalence of math anxiety in students caused by focusing on one correct answer (Harper and Daane (1998)), and inconclusivity of this study, teachers should consider grading assignments for participation.

3. Parents should encourage and supervise their children's homework time, while refraining from giving unneeded 'help'.
4. Teachers should feel more free to use class time and grade as they feel best fits the needs of their students.

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