Homework Usage in Mathematics

A study on the impact of optional homework in the math classroom

Logan J. Kimberly

MSE – Math
Final Project

University of Wisconsin – River Falls
2013

Advisor: _____
Dr. Robert Coffman

Date: _____

Abstract

Throughout the years, homework has been a rather polarizing subject in the educational field. How much homework should we give students? How effective is homework? Can students still achieve the same academically if homework is optional? This study is meant to explore the effects of optional homework in a high school mathematics classroom. The study consisted of five classes of Algebra II being team-taught. My two classes (the experiment group) were given optional homework throughout a unit, while my colleague's three classes (the control group) maintained the same mandatory homework assignments as in previous units. In place of the mandatory homework assignments, the experiment group received additional instruction time during class. This gave students a chance to practice problems and receive immediate feedback on their performance from the instructor. While the results are not conclusive, the experiment group did slightly worse on the initial assessments of the unit and considerably better on the final two assessments. The results have sparked a great deal of conversation within our math department on the best use of class time and how homework should be graded.

Introduction

Homework seems like it has been around since the beginning of time. The classroom cycle appears to be pretty consistent in most schools: the teacher teaches, the students learn (or at least that is the plan), and then homework is given to assess student learning. Although this process does not always happen exactly the way I have described on a daily basis, it pretty much sums up typical classroom procedures in our current education system. Of course teachers will vary their teaching styles, and homework can take many different forms like

projects, papers, daily assignments, or journal reflections, just to name a few. This cycle is especially prevalent in the math classroom where homework has been a vital means for teachers to assess students' understanding of the material taught. But is homework really working? Are students completing homework just to get it done rather than to actually learn the material? Is there a better use of time that would help students learn the material just as effectively (if not more effectively) than requiring students to do homework?

I think you will be hard-pressed to find anyone (especially in the field of mathematics) who would argue that homework is not beneficial. Much like it is helpful for an athletic team to actively practice skills and game-like situations to have success in contests, it is equally helpful for students to actually practice doing math problems to have success on assessments. Because homework is viewed as a fundamental part of the understanding process in math, many teachers give class time to work on homework, so students can collaborate with their peers or possibly ask the instructor questions if they get stuck. Although this process sounds like a good idea to allow students to get a start on their homework, I think there may be a better procedure to help students academically and better prepare them for post-secondary schooling. The purpose of this research project is to see if students can increase academic achievement when class time is used more effectively through additional instruction (rather than work time) and homework is made optional.

Literature Review

As previously mentioned, homework seems like it has been around forever, and just as long as it has been around, there has been a great deal of varying opinions on just how beneficial homework really is. As one article states, "it is clear that homework has aroused strong passions pro and con for the last 100 years" (Gill & Schlossman, 2004, p. 180). As early as the mid-19th century when public education in the United States began (www.nea.org), students were required to complete homework outside of the classroom. Most of this early homework consisted of recitation and memorization of various facts, written material, and grammatical rules (Gill & Schlossman, 1996). The amount of time this type of homework took to complete varied from student to student, but the general consensus was that it took approximately 2-3 hours per night. Although this seems like a lengthy amount of time, most parents did not seem to mind. One must keep in mind though that at this time, a minority of the population attended high school because most young adolescents were needed to work around the house in order to help the family financially (Gill & Schlossman, 2004).

Near the turn of the 20th century, researchers began collecting evidence on the effectiveness that homework had on academic achievement. Dr. Joseph Rice specifically studied children's spelling and found that the amount of time spent practicing spelling at home was largely not connected to one's spelling ability (Gill & Schlossman, 2004). This led many "progressive" educational people to view homework as more of a burden rather than a benefit. The progressives even coupled with the American Child Health Association and went so far to claim that homework was actually a health hazard because "homework threatened children's health

by depriving them of outdoor play that was essential to healthy development" (Gill & Schlossman, 2004, p. 176). Although not everyone bought into the claim that homework was a hazard to one's health, this anti-homework movement continued throughout the early 1900s. Other arguments against homework included viewing the home as an inadequate place to learn when compared to the ideal learning conditions of a classroom. Many progressive educators reasoned that it would be very difficult for students to learn at home "given its noise, poor lighting, and commonplace distractions" (Gill & Schlossman, 1996, p. 47).

It was not until the 1950s and 60s that the pendulum began to swing the other way for homework. During this time the U.S. and Russia were in the middle of the Cold War, and when the Soviets launched Sputnik, there was a common perception that Russian children were brighter and had achieved more in school than American children. This led many school boards and administrators around the country to reverse many political policies that limited the amount of homework students could receive, and as a result, many students reported spending a great deal more time working on homework outside of the classroom (Gill & Schlossman, 2004).

In more recent years, there has been a relatively happy medium between the two extremes. It is clear that parents, educators, and researchers find homework (at least to some degree) to be a necessary part of learning. That said, schools are trying to limit the amount of homework given to students, especially in the primary grades. Some schools have policies that limit the amount of time students should spend working on homework each night, while other schools

have declared certain weeknights (as well as some weekends and holidays) to be homework-free so that students will at least have one night off from doing homework and can spend time with families (Kalish, 2009). As with any controversial topic, however, the conversation can turn to bigger issues such as "whether students [can] be persuaded to attend school regularly, pay attention to [and respect] their teachers, and study seriously at all" (Gill and Schlossman, 2004, p. 179).

And so, the debate goes on in our current society with loud voices on both sides of the issue. Supporters for homework have research on their side, and the research is fairly clear and compelling. As Mazano and Pickering write, "with only rare exceptions, the relationship between the amount of homework students do and their achievement outcomes was found to be positive and statistically significant" (2007, p.75). Many studies have been done over the years to confirm these results. When comparing students who had no assigned homework to other students who were assigned homework, the experimental group (students with homework) always scored significantly higher on knowledge tests than those students who were not assigned homework (Marzano & Pickering, 2007). Another key argument for the use of homework is the fact that it allows for guided learning to happen outside the classroom, which is essential for students to retain knowledge they learn instead of just regurgitating it onto an assessment.

Dr. Harris Cooper of Duke University has done extensive research on the usefulness of homework and how it affects the achievement of students. He explains that factors such as

degree of choice, completion deadline, degree of individuality, and social context can greatly vary from assignment to assignment, which in turn could affect the efficacy of the assignment on an individual basis. Over the past seventy years, Dr. Cooper has conducted almost 120 studies on the effects of homework. His first type of study compared the achievement of students given homework to those given no homework. In fourteen of the twenty studies, those given homework had significantly better results. His second type of study compared the difference between assigning homework and having in-class studying. Again, the homework group had more favorable results but not nearly as much as in the first study. For the third type of study, Cooper analyzed the amount of time spent on homework in fifty studies, and in forty-three of them, time spent on homework had a positive correlation with the achievement outcomes. Interestingly enough, throughout all three types of studies, Cooper noticed a strong grade-level correlation, in which the differences in achievement were much greater in secondary students than those in junior high or elementary school (Cooper, Robinson, & Patall, 2006).

Furthermore, Cooper and his colleagues, wanting to compare their research with other studies on the effectiveness of homework, analyzed almost seventy similar studies conducted from 1987-2003. These studies were broken into two main categories: the first simply looked at achievement from the presence or absence of homework, while the second wanted to see if the amount of time students spent on homework was related to achievement.
Although Cooper's team stated that the studies were "all flawed in some way that compromised their ability to draw strong causal inference" (2006 p. 47), they also concluded

that “with only rare exceptions, the relationship between the amount of homework students do and their achievement was found to be positive and statistically significant” (2006, p. 48). Thus, while they warn against claiming homework directly leads to high achievement, they admit that there seems to be a rather apparent correlation. Additionally, a vast majority of the studies again found stronger evidence for the benefits of homework for secondary students than younger students. The researchers went on to conclude that they would further like to see similar studies on homework that include a number of variations such as gender differences, subject matter, and varying ability levels (Cooper, Robinson, & Patall, 2006).

Even with the scientific evidence to back the usage of homework, there are still many (including parents) who argue the other way. Many opponents still point out that homework causes a lack of physical activity, less family time, and even possible mental fatigue when done for hours each night. A more recent argument that is emerging is the fact that homework may actually be hurting less-privileged students. The harm may be affecting “economically disadvantaged students, who are unintentionally penalized because their environments often make it almost impossible to complete assignments at home” (Marzano & Pickering, 2007, p. 75). Another major issue with assigning homework is making sure students actually complete the assignments. As Mangione notes, “students who most need the practice and discipline of self-guided [homework] assignments are the ones who just never do them” (2008, p. 615). Kalish also brings up a valid point when she talks about the lack of educational training on assigning homework: “Your child’s teachers have probably never taken a course that covers what

constitutes good or bad homework, how much to give, and the research behind it" (2009, p. 74).

With all of the arguments on both sides of the fence, most people can see both sides of the issue. They realize that homework is useful and has a place in our educational system, as long as it is used in the right way. Marzano & Pickering sum up the issue pretty nicely with the following quote: "Teachers should not abandon homework. Instead, they should improve its instructional quality" (2007, p. 74). They go on to suggest that homework should be designed with a purpose in mind, rather than just being used as busy work. They also encourage teachers to create homework assignments students will actually complete and "maximize the potential for student success" (p. 78). Another homework adversary says that homework shouldn't be graded because it is meant to guide student learning, not test it. Mangione claims that homework is like practicing a sport, in which mistakes can and should be made in order to correct them before the test. This notion would in turn change missing assignments to a remediation issue rather than a failing grade (2008).

Justification for the Development of this Project

In my five years of teaching, I believe homework to be one of the most interesting questions in the ongoing discussions about how to help students learn. It seems like every teacher has a slightly different opinion on how much homework to give, how to grade homework, or simply how to get students to do the assigned homework problems. I have struggled with all of these issues and have yet to find a "best-practice" approach when it comes to the question of

homework. I am a firm believer in the sports analogy that Mangione mentioned in her paper, especially when it comes to learning math. In order for students (or a sports team) to have success, they both must actively practice the skills necessary in order to achieve at a high level. As such, the real question I have struggled with over the past couple years is "how do I get students to actually work on math problems and practice the skills necessary for academic success?"

Homework is defined as "any tasks assigned to students by school teachers that are meant to be carried out during non-school hours" (Marzano & Pickering, 2007, p.74). By this definition, I am not sure that many students actually do much homework. I have seen them frantically finishing assignments in other classes the hour before they are due or worse yet, simply copying a friend's assignment just to get it done. How much learning takes place when homework assignments are rushed like this? To me, the goal of homework in math is to give students an opportunity to practice the skills needed that will help them master the concepts taught in class. If I can get students to practice these skills in class, at least they will get some active practice, and hopefully this will give them more incentive to continue that practice outside of the classroom.

Recently, our district administrators brought up the issue of grading to our teaching staff. They were throwing out ideas that if we want students to achieve at high levels academically, we should only be grading using various forms of assessments. This means that we should not grade homework anymore, but, rather base grades solely on tests, quizzes, and projects.

Although our administration brought these ideas up for discussion purposes, many of the administrators I talked to feel this is where our grading system is headed. I thought then, that this would be a perfect idea for a research project, in that I could actually test to see if students are able to achieve at the same level (or higher) when homework isn't part of the grade.

Design of the Curriculum Development Project

The research question for this project is the following: *Can optional homework, paired with more classroom instruction, increase student achievement and ultimately better prepare them for post-secondary schooling?*

The instruction of the participants in this study took place during the 2012-2013 school year using curriculum from the Holt McDougal text *Larson Algebra 2*, specifically Chapter 5: Polynomials and Polynomial Functions (pages 328-407). For our algebra II classes at St. Croix Central High School, there were five sections with a total of sixty-nine participating students. I team taught this class with another teacher (Mr. Turpin), so my two sections were used as the experiment group (given additional classroom instructional time and optional homework assignments), while my colleague's three sections were used as the control group (graded homework and same instruction as before).

Although the two study groups were taught by different instructors, we took many steps to ensure that the different instructors had a minimal effect on our data results. Mr. Turpin and I met on a daily basis to review how we felt instruction went from the previous day and also to

go over what we expected to cover on the current day. We also collaboratively created and reviewed common homework assignments, quizzes, and tests. This would ensure that all students (regardless of what teacher they had) were taking the same assessments and receiving the same instructional topics. Although some natural variance during the instruction was sure to occur, we feel confident that any student could switch classrooms at any time and not miss a beat.

Prior to this study, all students received daily homework assignments ranging from ten to twenty-five problems, depending on the topic. At the beginning of each class period, answers were posted, and students were expected to check their assignments and make corrections to any problems they got incorrect. While students were checking their work, the instructor would come around to grade their assignment, solely based on completion, giving them a score of three, four, or five. In order to get a perfect 5/5 on an assignment, a student must have completed all problems, shown work or explained their logic, and reached a viable answer. If students did not quite finish each problem or if they needed to show more work, they were given a 4/5, and in order for students to receive a 3/5 they had to have completed at least 50% of the assignment. Because we only graded assignments on completion, it was not too difficult to get a 5/5. After grading the assignments, the instructor would then go over any problems which students had trouble completing. The idea behind this concept is that students should be able to make mistakes in homework and then correct them before the upcoming assessment. Once all questions were answered, new instruction would take place (with a new

assignment given), and then students would typically have five to ten minutes to start their new assignment during class.

Because we did not want to change anything with our control group, Mr. Turpin's algebra II classes continued to follow this same procedure. As for my classes (the experiment group), homework became optional, and therefore work time at the end of the hour was not necessary any more. I still gave students the "optional" homework problems and encouraged them each and every day to complete the problems outside of class. I still followed the same procedure of displaying answers to the homework problems at the beginning of the class and going over any difficult problems with students, but I simply did not record whether they completed the assignment or not. The only other change I made to the experiment group was additional instruction time throughout the end of the hour.

Instead of giving students time to start their assignment, I used different methods of skill practice to give students instant feedback on their performance. Some days I would ask students to complete a problem and then share their results with a partner. This would allow them to work together as a team and correct each other's mistakes in order to come up with the correct answer. Another technique I used was flashcards located around the room. Flashcards were taped to the wall in various locations around the room and on the front of every flashcard was a problem, while the back side displayed the correct answer. I would walk around the room helping students solve problems or explaining how to get particular answers. This technique was very beneficial because of its flexibility. It allowed students to work at their

own pace, while also giving them the option to work by themselves, with a partner, or in a small group.

I tried to vary this skill practice enough so students were able to use different ways to study for math assessments, but my favorite technique was using miniature whiteboards. This method was also very flexible as it allowed students to work at their own pace, either individually or referencing a neighbor for help, and gave them immediate feedback to see if their solution was right or wrong. I would give students a list of practice problems (similar to but not the same as their optional homework) and ask them to produce solutions for me on their whiteboards. The whiteboards were a great way to see students' full work and to identify exactly where a mistake was made. I would then simply respond with a "yes" or "no" based on what I saw. "Yes" meant they got the solution correct and could move onto the next one, while "no" meant there was something wrong with their solution and they needed to fix it. If a student got a problem wrong multiple times, I would offer advice on how to fix it, but generally, I tried to let students find their own mistakes or consult with a peer for help. This seemed to be the most effective method to reach students at an individual level and allow them to practice math skills at their own pace.

Results

To begin to analyze the results of this experiment, I first took a look at student data from the previous semester with regards to their test and quiz average. This would allow me to not only compare the control data with the experiment data but also compare each data set to the

previous semester to see which data set changed more. I found that Mr. Turpin's classes (the control group) had slightly higher numbers from the previous semester (about 2 percentage points) in both their test and quiz averages when compared to students in my classes (the experiment group). I took this into consideration when making comparisons between the two groups. Also, it should be noted that in both groups, for all quizzes and test, the average when compared to last semester was lower. This result is not surprising because students naturally struggle more with material in the second semester because it is almost all brand new as the curriculum moves away from review material. Specific data results can be seen below in Table 1.

TABLE 1

Results from the experiment group data

	1st Sem Quiz	1st Sem Test	Quiz 1	Quiz 2	Quiz 3	Unit 5 Test
Mean %	81.92	78.66	80.21	68.19	77.17	69.84
Median %	83.63	80.37	84.38	71.88	81.52	68.90
Standard Dev	11.88	12.52	15.85	21.14	18.44	17.25
Diff from 1st Sem			-1.71	-13.73	-4.74	-8.81

Results from the control group data

	1st Sem Quiz	1st Sem Test	Quiz 1	Quiz 2	Quiz 3	Unit 5 Test
Mean %	83.84	80.90	82.14	71.82	75.14	67.51
Median %	84.23	82.50	81.25	81.25	80.43	66.25
Standard Dev	11.68	13.77	17.46	23.08	21.99	21.55
Diff from 1st Sem			-1.70	-12.01	-8.70	-13.39

As seen from Table 1 and Figure 1, Quiz 1 showed no apparent difference. Although the control group had a higher average than the experiment group, the difference when compared to first semester was almost identical, making the higher average relatively irrelevant. Additionally, although the mean from the control group was higher, the experiment group had a greater

median, further making any results inconclusive. I feel there was not much of a difference for the first quiz because the material was fairly introductory and not overly complicated.

As for the Quiz 2 (see Figure 2), the control group had a higher average again; however, the difference appears to be more substantial this time when comparing to the first semester.

FIGURE 1

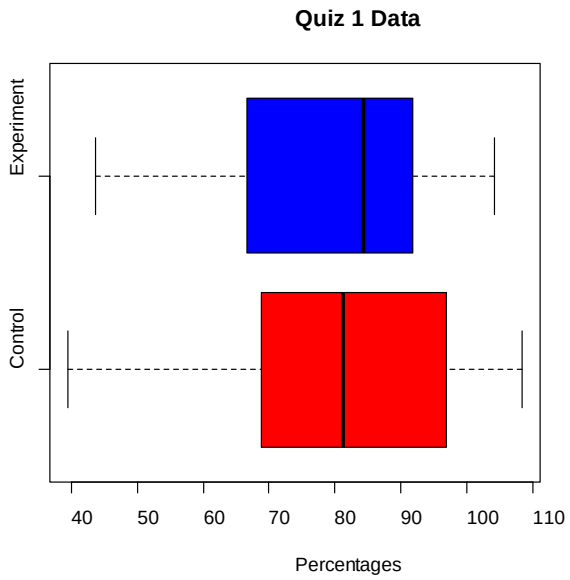
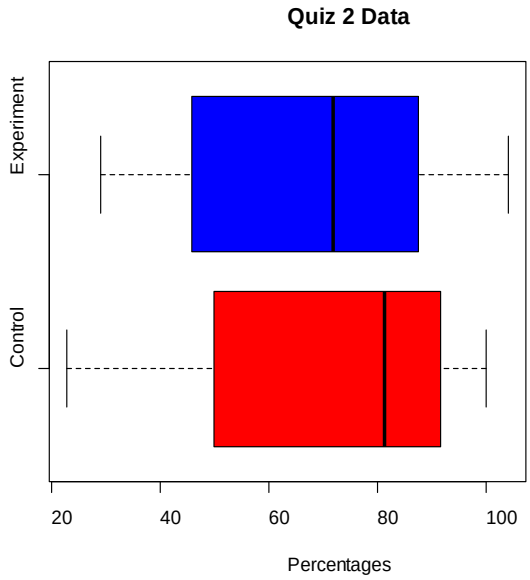


FIGURE 2



As the data shows, both groups struggled with this quiz, but I feel the experiment group struggled more due to their lack of work outside of class. In the beginning stages of the experiment, I could tell many students were doing little (if any) homework outside of class. When answers were posted at the beginning of the subsequent day, very few students had their assignments out to check and questions were scarce, which is usually a good indication that students did not do the assignment.

Although the control group seemed to have a slight advantage on Quiz 2, the experiment group had a very clear advantage on Quiz 3 and the unit test (see Figures 3 and 4). Not only did the experiment group have a higher average on both of the previously mentioned assessments (by about 2 percentage points each), my classes also had a better average when compared to the first semester. Personally, I feel that Quiz 2 was a wakeup call for many students in the experiment group. Numerous students who usually do quite well on assessments did not do very well on Quiz 2. I think this was a motivating factor for students to do a little more work outside of class, which paid off in the end as seen by the results of the last two assessments.

FIGURE 3

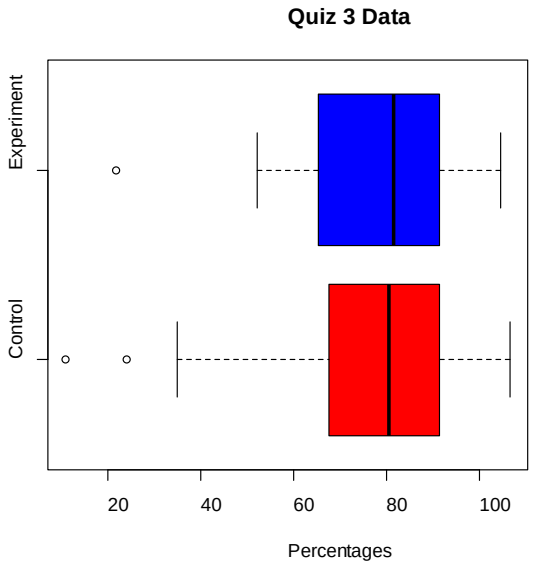
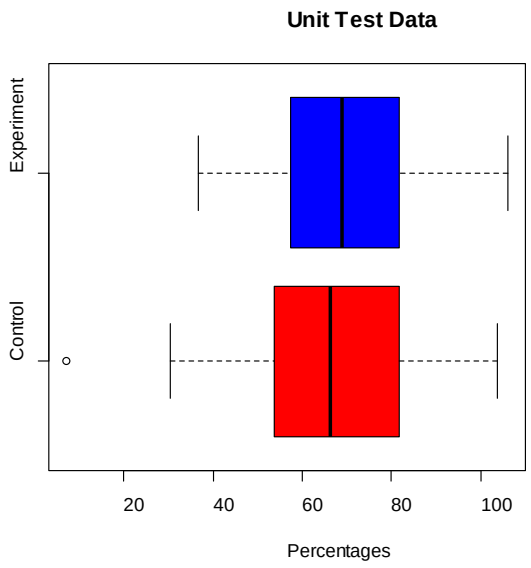


FIGURE 4



Much like the overall results of the assessments, students' opinions of optional homework seemed to vary as well. At the conclusion of the experiment, I gave students in the experiment group a questionnaire to gauge their feelings on optional homework. The first six questions were statements in which students were asked to rank (on a scale of 1-5) how much they

agreed or disagreed with the statement: 1 represented "strongly disagree" while 5 represented "strongly agree." The statements were as follows:

1) I did my full homework assignment on a regular basis.

2) I felt like I didn't need to do the assignments because I got the material while taking notes in class.

3) Prior to taking a quiz/test, I felt I knew the material fairly well.

4) After taking a quiz/test, I felt I did well on the assessment.

5) Overall, I liked having optional homework compared to required homework.

6) Overall, I feel like I learned more with optional homework compared to required homework.

In addition to these six statements, the seventh question asked students to list a percentage representing the amount of homework they did over the course of the unit. Specific data results can be seen below in Table 2. Interpreting the quantitative results from this survey

TABLE 2

Results from the student questionnaire subsequent to the experiment

#1	#2	#3	#4	#5	#6	#7
2.20	3.41	3.76	3.39	3.11	2.70	33.36

(recall the scale ranges from 1-5, so 3 would represent a neutral response), clearly less than half of the students did their full assignment (see #1), and most thought they did about 1/3 of the optional homework assigned (see #7). Most students were more confident going into the assessment rather than after taking the assessment (see #3 and #4), and although the average student slightly enjoyed having optional homework (see #5), most conversely felt they did not learn more with optional homework (see #6).

Along with the quantitative data from the questionnaire, there was also qualitative data collected by asking the question "Do you feel these additional problems (done in class that replaced work time on homework) helped your understanding MORE than working on homework?" Again, student opinions seemed to be fairly divided as seen from some of the responses below:

"Yes. I learned better by doing additional problems in class because we (the entire class) were all working on the same problem and could get help."

"Yes because it allowed us to ask questions and get instant feedback."

"It was less frustrating because [the teacher] found my mistakes a lot easier and did it from the start instead of three assignments later."

"Yes because it was easier to understand the homework when I did it."

"Yes! We actually got to show how we were doing it and get told if it was right or wrong before the assignment and I felt that helped a lot."

"I think it was about the same because problems I wasn't doing at home I was doing in class."

"Yes because if I didn't know, I got help right away rather than guessing."

"No. They helped about the same as doing the homework because I understand the material rather fast."

"No. If I had questions on the homework, I wouldn't know until I was at home."

"No because doing problems yourself helps more."

"Yes because [the teacher] was there to explain the problems and help us if we had questions in class."

"At times the in-class examples were more beneficial than homework assignments because I tended to get more help with problems."

"Yes and no. They helped a lot but not as much as a full homework assignment."

Reflection

To be completely honest, the results of the study quite surprised me. I thought students (particularly the lower-level students) would really struggle to work on optional homework outside of class, and therefore struggle on the assessments. This certainly seemed to be the case for Quiz 2, but then something seemed to change for the final two assessments. I am not sure if students began doing more of the optional homework or if the in-class examples with immediate feedback and extra help seemed to be paying off. I guess it was a combination of the two scenarios mentioned. I clearly underestimated the impact of doing in-class examples when students were able to receive immediate feedback to correct mistakes. After discussing these results with Mr. Turpin, we have decided to make a change that incorporates both benefits of graded homework as well as immediate feedback. When we give students work time in class to begin working on their assignment, we have begun to post the answer key to the assignment right away. Students already know they must show work in order to get credit for the assignment, and this allows them to check their answers right away (giving them immediate feedback on an individual level) and make any necessary corrections all while still in class where they can ask for help if needed. So far, students have responded well to this change and frequently remind me to put up answers if I happen to forget.

After looking at the data results a little closer, I was able to make a couple other noteworthy conclusions. First, for almost every quiz in both groups (except Quiz 1 in the control group), the group median was greater than the group mean. This indicates that the data is slightly left skewed (which can be seen by the box and whisker plots) and has a few data values quite a bit lower than the median. Looking at data from the first semester, this trend seems to be fairly consistent with the mean being slightly lower than the median. However, again in both groups, the mean test score was greater than the median. This indicates a data set that is slightly right skewed and has higher data values that affect the mean more than the lower values. I am not really sure how to explain this phenomenon because both assessments (quizzes and test) are very similar in design and difficulty. My only assumption is that the upper-level students prepared a little bit more for the test knowing it holds more importance than the quizzes. I did find it interesting that this result occurred in both groups though.

Another interesting fact is that for every assessment, the control group data had a larger standard deviation than the experiment group. This leads me to believe there was a larger gap between the upper and lower-level students in the control group, which would make the data more spread out and further away from the mean. Talking this over with Mr. Turpin, we concluded that students who rarely do homework (graded or optional) outside of class would benefit much more from the immediate feedback of the in-class examples with the experiment group. The in-class examples would at least give struggling students some guided practice time that would most likely help them more on an assessment. This conclusion is something our

math department is continuing to discuss and merits further study as to how best to help struggling or unmotivated learners.

As I previously mentioned, the results of this study truly did surprise me. I felt students would have a difficult time being motivated to complete optional work outside of class, and for the most part, data showed that was correct because most students reported doing minimal optional homework. However, students really appreciated and seemed to internalize the feedback they got while doing the in-class examples using a variety of different learning strategies. This study is especially significant in our district as we are constantly striving for growth in student achievement. Particularly, this study may propel the way we use our class time and how we grade homework in the future. Perhaps the best scenario would be to use all class time as instructional time (filled with example problems and immediate feedback), and then give students a graded assignment to be completed outside of class. This way, students would receive the benefits of guided practice in class, while still benefiting from individual practice outside of class. Students would hopefully be able to correct mistakes made in-class and still have motivation (in the form of a grade) to complete their assignment. Either way, this study has inspired me to try different teaching techniques in my classes to see what will result in the most student achievement, which is the ultimate goal.

Bibliography

Cooper, H., Robinson, J. C., & Patall, E. A. (2006). Does Homework Improve Academic Achievement? A synthesis of Research, 1987-2003. *Review of Educational Research, 76(1), 1-62.*

Gill B., & Schlossman, S. (2004). Villain or Savior? The American Discourse on Homework, 1850-2003. *Theory Into Practice*, *43(3),* 174-181.

Gill B., & Schlossman, S. (1996). "A Sin Against Childhood": Progressive Education and the Crusade to Abolish Homework, 1897-1941. *American Journal of Education*, *105(1),* 27-66.

Kalish, N. (2009). The Less-Homework Revolution. *Parenting School Years*, *23(1),* 72-76.

Larson, R., Boswell, L., Kanold, T. D., & Stiff, L. (2011). *Larson Algebra 2.* Orlando: Holt McDougal.

Mangione, L. (2008). Is Homework Working? *Phi Delta Kappan*, *89(8),* 614-615.

Marzano R., & Pickering D. (2007). The Case For and Against Homework. *Educational Leadership*, *64(6),* 74-79.

National Education Association. (2006). http://www.nea.org/home/11608.htm