What Motivates Middle School Math Student to Complete Their Homework?

Erin Everson

St. John Fisher College

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What Motivates Middle School Math Students to Complete Their Homework?

A second year middle school mathematics teacher has seen a reoccurring problem of students who fail to complete homework assignments. During her first year of teaching she noticed that she had three groups of students when it came to homework completion; those that always did their homework, those that never did their homework, and a group of students who occasionally did their homework. The mathematics curriculum is designed so that each topic builds upon the previous topic which further reinforces that students need to stay with the current topics and not fall behind in order to be successful. She feels that homework is an essential part in the mathematics classroom because it allows for practice to reinforce the day’s lesson. She researched what motivates students to do their homework within her seventh grade math classroom.

The researcher feels that there is a great importance in homework completion because it reinforces the day’s lesson, teaches the students responsibility, and allows the student to be in control of their own learning. The standards that are being set by New York State for today’s middle school students incorporate more content and higher level mathematics than ever before. Last year, New York State implemented new requirements for students to be tested at every grade in middle school for mathematics. This means that today’s middle school math students are not only required to know more mathematics, but there is no room for students to fall behind.

The researcher chose to look at four major factors that motivate students to do their homework; the psychological changes of adolescence at the seventh grade level,
intrinsic versus extrinsic motivation, improving homework completion through targeted homework assignments, and parent involvement in homework.

The researcher's seventh grade math classroom provided the basis for the investigation as to what motivates students to complete math homework. Since she has not implemented any of the research theories, the first quarter homework grades for her students will be the control group, and she can base her observations on their homework grades over the next two quarters. The researcher hopes that through the experiments, she can expect more completion of daily homework and an increase in their homework grades. She also hoped to gain a deeper understanding as to what motivates students so that they can reach the raised standard of academic achievement.
Literature Review

The topic of this thesis is motivation for middle school math students towards homework completion. This has been an area of concern because of the growing number of students in this age group who do not complete daily homework assignments. The standards that are being set by New York State for today’s middle school students incorporate more content and higher level mathematics than ever before. This means that today’s middle school math students cannot fall behind and by completing daily assignments they can achieve the high goals that are set for them by the ever changing curriculum.

The research that has been done in this focus has a variety of explanations, beliefs, and recommendations towards what motivates students to complete out of class assignments. This literature review first focuses on the importance of homework and how it relates to academic achievement. There have been multiple studies that have concluded a positive correlation between homework completion and high academic achievement. There has also been research done on how this is specifically true for mathematics and that students who complete daily homework assignments are more motivated to succeed in mathematics. There was also research that found psychological changes in adolescence and the changing school environment from elementary school to middle school to be a major factor in a student’s willingness to complete homework. This literature review also explores intrinsic motivation versus extrinsic motivation with conflicting opinions from different researches. Many researches gave recommendations on how to improve homework completion, specifically looking targeted homework and at goal theory which is when students create their own goals, they take ownership over their learning. Parent
involvement is also a major factor in homework completion by parents’ involvement in the school community, their willingness to help their students with their homework, and providing an environment at home that is conducive to learning.

Although the explanations for what motivates students to do their homework, these specific areas were focused on in this literature review because they are of primary focus as the larger factors of motivation for middle school students.

Homework and Academic Achievement

A great deal of research done by Bempechat (2004) has stated that academic achievement had a positive correlation to homework completion, regardless of the students’ abilities and prior coursework. Homework was also stated as time when children received the training they needed to become positive learners because of the skills they learned about achievement and coping strategies for difficulties and setbacks (Bempechat, 2004). Homework was also found to have long-term effects on the students’ development of achievement and motivation, while teachers supported homework also for the benefits it had over reinforcing daily learning and the development of study skills (Bempechat, 2004). This research was also supported by Xu’s (2004) who stated that there are ten purposes for doing homework; practice, preparation, personal development, parent-child relations, parent-teacher communication, peer interactions, policy, public relations, and punishment. The research also stated that parents and teachers agreed that homework reinforced school learning while also teaching students responsibility and study skills. However, only 75% - 78% of the students from this study strongly agreed that homework helped them develop responsibility, study skills, and reinforced the
learning. Hence, there is a gap in the views of homework from the adults and about 25% of the students. (Xu, 2004)

Mathematic Achievement

The research by Singh, Granville, and Dika (2002) stated that by the time students reach high school they had already made decisions on whether or not to pursue advanced mathematics courses, which was based on their earlier success in mathematics. The study found that motivation was correlated with academic achievement and therefore students who achieved higher academically were more likely to take advanced courses and pursue careers related to mathematics. It was stated that mathematics courses are sequential, so those students that were successful in middle school were more likely to achieve academically in high school. The research also stated that doing homework reflected student engagement and motivation, and therefore students who completed homework were academically successful and were more likely to continue their study of mathematics into more advanced courses (Singh et al., 2002).

Psychological Changes in Adolescence

Anderman and Maehr (1994) focused their research on middle school students’ motivation in the whole school environment. The research stated that the main concerns for adolescents and motivation was that “adolescents either don’t have it, have too much of it, or invest it in the wrong activities” (Anderman and Maehr, 1994, p. 287). The middle school years were looked at as a time when adolescents are emerging into adulthood and achievement is taken seriously because it relates to future career paths.
Although changes in motivation is a cause for concern at any level, it is particularly of concern at the middle levels because students start to direct their course choices based on their interest and might rule out courses that they would need for future career education. The research stated that this is a problem that needs to be addressed at the middle grades because at this level students attitudes in school, specifically for mathematics, science, and art, starts to significantly decrease. According to Anderman and Maehr, “overall, the literature supports the view of decreased investment in academic activities and increased investment in nonacademic activities during the middle grades” (Anderman & Maehr, 1994, p. 288). Singh et al. (2002) stated that by the eighth grade students’ attitudes towards school which correlates to motivation is already in existence. The research suggested that the changes from elementary school to middle school, such as the instructional practices and educational policies, don’t support students’ motivation. Much of the research that has been done on motivation of middle grade students suggests that our classrooms are enabling these motivational problems for adolescents (Anderman & Maehr, 1994).

Anderman and Maehr (1994) also stated that “placing motivation in a cognitive context associated motivation with the wider concern and effort directed to the understanding of cognitive change with age, strongly influenced by renewed interest in the work of Piaget” (Anderman & Maehr 1994, p. 290). This showed that as students enter adolescence they believe that achievement is a direct result of an internal trait, rather than related to the effort that they put forth in their academics. As students enter into the middle grades they take on the beliefs that trying in school has a higher risk because if he or she put effort into it and fail, he or she will be looked at as a failure.
Instead these students learn coping strategies where they avoid these type of settings and are perceived by their peers as not trying in order to maintain a positive self image so that others view them as competent. The most widely used adaptive strategy is not to study, which shows the teacher and peers that although the student failed, he or she is competent, even if that's not how the student inertly feels about his or herself. The research also stated that “as children move through childhood and into early adolescence, their self-concepts include more psychological descriptors (in addition to behavioral and physical descriptors) and are based more strongly on information received from social comparisons with other children” (Anderman & Maehr, 1994, p. 292). The overarched problem of students who use these coping mechanisms for their lack of motivation in the right focus is that they could “adopt possible self-schemata that define life goals and life tasks in terms if present failure, rather than future possibilities” (Anderman & Maehr, 1994, p. 292).

**Intrinsic Motivation vs. Extrinsic Motivation**

The research stated that effectively learning mathematics requires that students do homework, but teachers have had difficulty getting their students to complete assignments out of class (Tripp, 1998). Teachers have tried a variety of strategies such as creating expert groups that make students responsible for a problem to teach to the class, (Tripp, 1998) have pizza parties for students who complete all assignments for the quarter, recess or free time on Fridays for the students who completed all homework assignments for the week, or had students sign in at the beginning of class when they did not do their homework (Anonymous, 2001). However, each of these researches
concluded that there was negative side effects to each of these strategies and that they do not work for all students. Xu’s (2005) research on “Purposes for Doing Homework Reported by Middle and High School Students” stated that intrinsic and extrinsic reasons were associated with homework behavior and achievement. The research found correlation between intrinsic reasons for homework behavior and a small correlation between extrinsic reasons and homework behavior (Xu, 2005).

Extrinsically motivated behavior was referred to as behavior that can be controlled by external stimuli to the task (Akin-Little, Eckert, Lovett, & Little, 2004). The research has proved that rewards such as grades, stars, stickers, privileges, free time, and tangible items can be used to increase academic performance, but conflicting results have disagreed as to what happens after the rewards are removed (Williams & Stockdale, 2004).

Intrinsic motivated behavior was defined as “there exists no recognizable reward except the activity itself...that is, behavior that cannot be attributed to external controls” (Akin-Little et al., 2004, p. 346). Intrinsic motivated behavior was also defined as the need for achievement and the need to feel competent. The research stated that an exact definition of intrinsic behavior was hard to define and categorized intrinsic behavior whenever there was an absence of extrinsic behavior. This type of behavior not only enabled people to feel more competent, but also self-determined which resulted in creativity, flexibility and spontaneity (Akin-Little et al., 2004). This further supported the literature in that the goal of many teachers was to how to make their students more motivated intrinsically rather than extrinsically.
The research asserted that extrinsic motivators may have had negative results on a student's intrinsic motivation once the extrinsic reward was removed. It also stated that extrinsic motivators decreased a student's perception of competence of themselves and their creativity, which are key behaviors for intrinsic motivation (Akin-Little et al., 2004). The research on extrinsic and intrinsic motivation has conflicting arguments because some research has found that external rewards actually promote involvement in intrinsic motivated activities (Williams & Stockdale, 2004).

Further research stated that there is not a way to not extrinsically motivate students because all intrinsic motivation is linked to extrinsic motivation. The research stated “seemingly inner origins for a behavior initially may have been external to the individual” and “behaviors that appear to be self-sustaining may be influenced by subtle environmental events” (Williams & Stockdale, 2004, p. 214). The research gave examples of students who completed homework because the received positive feedback from their parents and teachers and this reinforced the behavior in the students to where they internalized it to become intrinsically motivated. This was supported by Akin-Little, et al. (2004) which stated that even verbal praise, head nods, and smiling could be considered extrinsic motivation to make children dependent on adult approval.

The research conflicted on the exact definition of intrinsic motivation and how to guide students to be more intrinsically motivated, but the research agreed that rewards can have a negative, positive, or neutral effect on intrinsic motivation based on the individual student. The research also agreed that the goal is to have students develop their academic goals and move towards being intrinsically motivated students.
Improving Homework Completion

Recent literature has stated that teachers have explored new strategies to improve homework completion. Bryan and Burstein (2004) studied a group of teachers who found improved homework completion by setting expectations of the homework to the students by letting them know how long the assignment should have taken them, how it was evaluated, and when it was collected. Supporting literature also stated that when the homework was moderately challenging, that is, it matched the students' goals with their ability levels, the teachers saw in an increase in homework completion. Students with disabilities were more at risk for problems that would interfere with homework when the homework was not aligned with their ability level because of their disabilities in basic math skills, reading levels, or organizational skills (Margolis, 2005). Parent communication with the teacher through agendas, phone calls, and emails was also found to increase homework completion because teachers received feedback from the parents about how much time students spent on their homework. When teachers didn’t address the issue of aligning homework to the needs of the students, the students did not feel successful and in turn it created more problems by not only affecting their achievement, but also their behavior (Margolis, 2005). The research found that there needed to be an improvement on the teacher's skills of preparing homework assignments based on the expectations the teacher wanted from the daily homework assignments. The research also stated that when students used cooperative study teams, homework planners, had parent involvement, and were taught how to self monitor and goal set there was an increase in homework assignment completion (Bryan & Burstein, 2004). These studies had found that through communication between teacher, students, and parents along with correctly
teaching students to be responsible for their own learning, there was an increase in homework completion.

**Goal Theory**

Anderman and Maehr (1994) stated that goal theory, has taken action in solving the problems of lack of motivation for middle grade students. The researchers found that when students created goals their motivation increased because they perceived a course of action in obtaining the goals they set for themselves. The researchers focused on two types of goals, task-forced goals, in which students learned for intrinsic reasons and ability-focused goals, in which students made goals to demonstrate their abilities over other students. The research found that students who adopt task-forced goals engaged in deep cognitive processing and were more motivated and took ownership over their learning. However, students who made ability-focused goals showed more help seeking strategies to aid their motivation in learning. The psychological environment of the classroom has a strong influence on the goals the students set for themselves. A teacher who focused on grades resulted in students who created ability-focused goals for themselves where as teachers who focused on improvement had students adopt task-forced goals. Elementary schools are set up where students spend their time with one teacher all day, but in middle school, students spend their day with many teachers and often many different students. As a result, when a student's day revolved around the school community as a whole, then so did the student's motivation to learn. Often in the middle school, school wide practices, such as posting a list of the high honor roll students, emphasize students to be oriented to have only ability-focused goals. Therefore,
the research states that the school community needs to work as a whole to redirect the students to be task-focused goal oriented (Anderman & Maehr, 1994).

**Targeted Homework**

Heitzmann (1998) stated that teachers are concerned about the effectiveness of their homework because some studies showed that out of class work has no value and a large percentage of students are not doing out of class work when it is assigned. The researched also stated half of these teachers used textbook assignments and another 25% used worksheets for their out of class assignments. The United States Department of Education stated conflicting comments in that students should be assigned not only more homework, but that teachers should have demanding requirements when it comes to homework. Heitmann (1998) stated that students will do the homework and it will contribute to the learning when teachers assign targeted homework, which are assignments that are carefully planned, assessed, and integrated. “Targeted homework is based on the belief that homework can make a significant contribution to student achievement in the areas of knowledge, skills, and acquisition of values” (Heitzmann, 1998, p. 53).

Minotti (2005) researched middle level students and found that students achieved significantly higher test scores when their instruction was aligned with the students’ individual learning style. Minotti used the Dunn and Dunn Learning-Style Model that consists of five learning styles; environmental, emotional, sociological, physiological, and psychological. The research stated that for teachers who were reluctant to change their teaching style, would get the same results of higher tests scores by providing
homework based on the students identified learning-style strengths. Minotti (2005) used a computer generated prescription to identify a controlled group of students' learning-styles and then provided each student with a description of their individual learning-style and the skills associated with each learning-style. This investigation used homework and studying interchangeably because they were directly related in this study to improve academic achievement on tests. The research found that time spent doing homework and studying needed to be examined to improve the quality rather than the amount of time spent. The research concluded that students who studied through their learning styles, found through computer generated homework prescriptions, “achieved statically higher achievement-test scores than either those same students when studying without homework prescriptions or other students who were not provided homework prescriptions” (Minotti, 2005, p. 70). More specifically, the researcher found a dramatic increase of 6.8 points in the students' mean math scores over the control group which only had a one point increase with traditional homework. The use of the individualized homework prescriptions was also effective in improving the attitudes towards homework. Minotti concluded that the skill of teaching learners how to complete homework assignments effectively through his or her individual learning style is an invaluable tool, because learners would learn how to adapt and teach themselves content.

Hong, Milgram, and Rowell's (2004) research supported Minotti's in that he found students who applied the own preferences to homework had a more positive attitude towards homework and motivated them to complete homework assignments (Hong et al., 2004). The research stated that when students were given choices on their homework, it helped them acquire a self-awareness of themselves as learners and made it
more meaningful and productive. The research also stated that teacher training was a critical aspect in motivating student’s homework completion. Teacher training included not only adaptive homework assignments, but also taught teachers strategies to use for students with homework difficulties, and how to assess students learning profiles. Young (2001) supported Hong by finding that providing worthwhile work to the students resulted in increase in homework completion. Homework should be important and stimulating and will get better results from the students when it is not perceived as busy work. When teachers planned out of class work, they got the most positive result from students when the work included practice, preparation, extension, and creativity (Heitzmann, 1998). Practice assignments had the potential to be the most boring, but should include variety and individualization. Preparation assignments, which normally are used to provide background information, such as reading a chapter in a textbook before class, should include interactivity based on the students learning style to improve learning and the likelihood of completion. Extension assignments proposes students with higher level thinking but should be guided by teachers through individualized activities rather than assignments designed for the whole class. Creativity assignments should be left open ended for out of class learning experiences for students to display their knowledge and their preferred learning style. The targeted homework research found that assignments designed around a student’s individual learning style encouraged the motivation students need to benefit from the time they spent on out of class assignments.
Parent Involvement

Bempechat (2004) stated that “parent involvement is a key ingredient in the development of beliefs and attitude that help to foster academic achievement” (Bempechat, 2004, p. 192). The research further stated that after elementary school, a student’s attitude about homework was positively associated with parents’ attitudes and the lack of a student’s positive attitude on homework would be a direct result from a parent’s negative attitude towards homework. Parent involvement in their child’s homework takes three different forms; behavior, personal investment, and cognitive/intellectual support (Bempechat, 2004). A parent’s behavior or being involved in parent-teacher conferences and other school events is vital because the parents and teachers become a team with open communication and shared expectations (Young, 2001). The parents’ personal investment showed their child that they enjoy their child’s school and the interactions that they have with the school personnel. The cognitive and intellectual support of helping with homework communicated to students that education is valued at home (Bempechat, 2004). It was concluded that students “said they were most attentive to homework when completing it with a parent” (Corno & Xu, 2003, p. 505) and that students who received help from their parents on homework were more likely to be high achievers, which are students with higher grade point averages and higher test scores.

The research suggested that through interactions with parents, students are learning motivational socialization practices which foster the attitudes that value effort and tolerance for mistakes and setbacks (Bempechat, 2004). Students learn from their parents coping strategies when the content becomes too difficult, a way to deal with
distractions, how to keep focused on the task at hand, and persistence. Standards, modeling, and appropriate feedback help students develop effective self regulated skills and routines (Corno & Xu, 2003). With the help of parents, students also learned how to manage their time according to deadlines, regulate their time, improve motivational skills, including goal setting, and organizational skills. Students need to know that they have the support of their parents and teachers to acquire new knowledge and master skills, especially when they are faced with frustration and setbacks (Bempechat, 2004). Parents who familiarized themselves with their child's homework fostered beliefs that academic success is controllable which can further develop into a student's development of causes for success and failure in life. The research also stated that parents who advocate for little or no homework are not preparing their students for the academic demands that they will eventually have to face. These parents communicated to their children that they don't have the ability to rise to the teachers' expectations and consequently undermined the child's beliefs about themselves as effective learners. Parents who do not support a teacher's homework policy communicated to their children to take on their own negative attitudes towards homework (Bempechat, 2004).

The research also argued that parents of middle school students felt less capable of helping their children with the homework because of the idea that students are not taught the same today as they were taught years ago. The research showed that the parent's education level appeared unrelated in the aid of homework management. However, parent involvement was critical in controlling emotion and arranging the environment of where the student completed his or her homework (Corno & Xu, 2003). The research also found that students need to do their homework in an environment that
is set up to accommodate their needs for light, sound, design, intake, and mobility. These studies suggested that “accommodating students’ home learning preferences by manipulating environmental conditions will make homework completion more meaningful and productive” (Hong et al., 2004, p. 201). The research found that some parents assume certain conditions provide the best learning environment for their child, however each learner has unique preferences that influence their ability to complete school assignments at home. Similarly, many teachers are unaware of a student’s learning preferences because the teacher only sees how the student completes assignments in the school which is a controlled setting (Hong et al., 2004).

Significant research has also been done on social class and homework because at one time at risk students – students who were living in poverty, or had parents with low levels of education, or had parents who spoke English as a second language – were associated as parents who neither cared about nor were involved in their child’s education. However, the research stated that when parents provide daily structure and a place for homework completion, they communicate to their child the importance of education. When these parents help with homework, even if they do not understand it, and communicate with their children about their own struggles with occupational difficulties, they are preparing their children for the competitive world of work (Bernpechat, 2004). This research also conveyed that when parents are involved in their child’s school work, the teachers are less likely to hold the stereotypes of low income parents that are disassociated with their child’s education. Particularly, Catholic schools have consistently set high expectations and standards for homework with positive results.
from parents of low income students because they are aware of the difficulties they will face in the future (Bempechat, 2004).

Summary

The studies that have been done on determining what motivates middle school students to complete their homework are extensive and explore many avenues. The literature stated that the students’ motivation for homework is internalized by their development into adolescence and by their own intrinsic motivation. The literature also found that parents can be responsible for homework achievement by being involved in their student's school life, by helping them with homework, and extrinsically motivating them. The literature also found that teachers can be responsible for homework completion by extrinsically motivating the students, assigning more targeted homework, setting student created goals, and keeping open lines of communication with parents. However, the literature from many of the researches agreed that homework has a long-term effect on middle school students for higher academic achievement, increased study skills, and responsibility. The lack of completion of homework assignments by today’s middle school students is a growing problem and with the positive effects that are associated with doing out of classroom assignments, there is a need for continual research into this topic to better understand what motivated middle school math students to do their homework.
Methodology

This research that focused on what motivates seventh grade math students to do their homework looked at four different areas that the research stated are the most influential in motivating this type of students; intrinsic motivation, extrinsic motivation, parent involvement, and targeted homework assignments. The teacher of these groups used the students’ first quarter homework grades as the control group of this experiment to determine what motivates the majority of the groups. The teacher used many activities and materials that were already in place in her classroom to complete the research.

Participants

Sixty-five seventh graders, who ranged in age from twelve to fourteen years of age, in the Midlakes Middle School in Clifton Springs, New York, were chosen to participate in this study. All of the students in this group are on the regular track for seventh grade mathematics. The group of students were divided into different sub-groups for class periods by the administration of the school at the beginning of the year. The first group, or Group A, consists of twenty-one students, with fourteen boys and seven girls. The second group, or Group B, consists of nineteen students with ten boys and nine girls. The third and last group, Group C, consist of twenty-five students with twelve boys and thirteen girls. The Midlakes Middle School is a sixth through eighth grade school in a rural community in upstate New York. The school currently educates 406 students, with 123 of them in the seventh grade this year. The ethnicity of the current student population is 97% white or Caucasian, 1% African American or black, 1% Hispanic and 1% American Indian or Asian/Pacific Islander. There is 0% limited English proficiency and
all students speak English as their first language. The two towns that support this school
district, Phelps, New York and Clifton Springs, New York are middle class families with
28% of the students qualify for free or reduced price lunches. The school district also has
a 96% attendance rate.

Materials

There was not any materials needed that did not extend from the normal seventh
grade mathematics classroom setting. The procedure that looked at four different areas
that effect homework completion all use materials that are already provided to the teacher
by the school district. The teacher used the computer program, Power Grade, which is
provided by the school district for a computerized grade book that aided in comparing the
data of homework completion for the students in the groups.

Procedure

Based on the literature, this study focused on four of the most important factors
that influence a student’s motivation to complete homework assignments. The teacher
focused homework assignments as more targeted homework assignments. The research
done by Heitmann (1998) concluded that students will do homework when the
assignments are carefully planned to their learning style, assessed and integrated into the
classroom. The teacher gave students choices on their homework assignments that use a
variety of learning styles and students were able to pick the homework assignment of
their choice to determine if targeted homework assignments increase homework
completion. The study on the groups also focused on determining if parent involvement is
a factor in homework completion. This study was done through the usual classroom activities of asking the students on various days if their homework was completed, did their parents help them complete it? Xu’s (2005) research stated that intrinsic and extrinsic reasons were associated with homework behavior and achievement and that there was a correlation between intrinsic reasons for homework behavior and a small correlation between extrinsic reasons and homework behavior. To determine if extrinsic motivation will aid in a student’s completion of homework, the teacher explained to the students that for any of the students in her groups who complete all homework assignments for the month of January, will be rewarded with a pizza party at the end of the month. The data that was collected from this part of the study was compared with how many more students are motivated to do the homework for the pizza party, than when there is no reward for homework completion. As a part of the normal classroom activities, all students are asked to anticipate their grade before they take a math which is based on a series of questions about how they studied, how much they studied, who helped them study, and why they studied. This same activity will also be used based on weekly homework assignments to determine which students are intrinsically motivated and why they are intrinsically motivated.
Results

The control group of the experiments that were done is based on the first quarter homework grades of the individual students when no implementations were done to aid in improving the individual student’s homework grade. The combined sixty-three students in this study were broken down into three groups, the first one being those that always did their homework, meaning they completed ninety five to one hundred percent of the homework that were assigned, the second group being those that sometimes did their homework, meaning they completed 65% to 94% of the homework. The third group was classified as those that never did their homework meaning they completed 64% or less of the assignments for the first quarter. An excel document, Appendix A, was used to determine the grouping and averages of the homework grades for each student and percentages were rounded to the nearest whole number. The results of the first quarter homework grades were 40% of the students were classified as always doing their homework, 52% were classified as sometimes doing their homework and 8% were classified as never doing their homework.

Targeted Homework

For the second quarter, the homework assignments that were assigned by the teacher were “targeted homework” assignments, meaning that the assignments were planned to have value to the classroom and to the students, while also assessed and integrated into the lesson. The researcher looked at a variety of homework assignments that were given throughout the quarter and analyzed the results of the types of assignments that had higher completion from the majority of the students.
The first homework assignment that was looked at was *Worksheet page 53-55*. This assignment can be found as Appendix B. This three page assignment consisted of ten problems in which the student had to look at an irregular figure drawn on a coordinate plane, separate the figure into smaller figures and then find the area of each figure. Five of the problems required minimal work of just answering the multiple choice question of which figures the irregular figure can be separated into, but the other five questions required extensive work of figuring out the dimensions of the sides of the figures. The teacher expected that this homework assignment would take about twenty minutes to complete. Seventy-one percent, or 45 of the 63 students completed this homework assignment.

The next assignment that was examined was *Worksheet Day 38*, which can be found as Appendix C. For this assignment the students completed four problems of using the percent proportion to find the missing value and the other four problems were word problems that were applicable to a seventh grader outside of the classroom. These four problems also used the percent proportion that was learned during the day’s lesson. The teacher expected that this homework assignment would take ten to fifteen minutes to complete. Eighty-three percent, or 52 of the 63 students completed this homework assignment.

Another assignment that was looked at was *Worksheet Day 47b*, Appendix D, which covered probability of dependent and independent events. The worksheet consisted of five word problems where the students had to determine if the event was independent or dependent and then appropriately find the probability. The problems on this worksheet were also relatable to situations for the average seventh grader. The teacher expected that
this homework assignment take between five and ten minutes to complete. Seventy-eight percent, or 49 out of 63 students completed this assignment.

The next assignment that was examined was *Worksheet Day 58* which focused specifically on prisms and cylinders. This assignment can be found as [Appendix E]. For this worksheet, the students answered twelve problems by drawing three dimensional figures, drawing the net shape of three dimensional figures, and labeling figures that were drawn on the worksheet. The teacher expected that this homework took five minutes to complete. Ninety-seven percent, or 61 out of the 63 students completed this assignment.

The last daily homework assignment that was examined was *Worksheet p.164* which had the students answer six problems to find the surface area of a cylinder. This assignment can be found as [Appendix F]. The students were given the formula for surface area of a cylinder on a reference sheet during class, but the formula was also photocopied onto the top of the worksheet. The students will be given a reference sheet on the state test and the curriculum does not require them to know this formula. The first three problems were very straightforward in which the radius and the height of the cylinder were given and the students just need to write the formula, substitute, use a calculator to solve, and label the answer. The last three problems were word problems, but required minimal effort by only having to find the important information in the problem and then again find the surface area similarly to the three previous problems. The teacher expected this homework assignment to take about ten minutes to complete. Seventy-five percent or 47 out of the 63 students completed this homework assignment.

During the second marking quarter, the students were assigned a small survey project. For this project, the students were given a rubric, Appendix G, and an outline,
Appendix H, of the steps and required work they needed to do to complete the project. They were asked to come up with a topic of their choice that they could survey a group of people. They needed to write four survey questions on that topic, one of each of the types we had learned in class; multiple choice, short answer, numeric, and fill in the blank. They also needed to decide on a sample of people to survey and explain why their survey was not biased. At this point, each student met with the teacher and then they began collecting their data. The students needed to turn in a written paragraph explaining their steps and a visual display of one of the questions using a frequency table and one other type of graph. Each class was given two class periods, which was about 75 minutes to work on the project and was expected to spend about one to two hours outside of class working on it as well. The students were also given two weeks to complete the project. After accepting many late projects and holding students for detention, 75%, or 47 out of 63 students completed this assignment.

**Extrinsic Motivation**

In order to determine if the seventh grade math students could be extrinsically motivated to complete their homework assignments, one class was offered a reward if they could increase their homework completion. This specific group of students was told that everyone in the class needed to maintain their homework average of 87% or higher and there would be a reward if they met this goal by the end of January. The class decided on their own reward of having a class pizza party, which made the researcher anticipate more would accomplish the goal because it was a reward that the class had decided together. After the first week, one student out of the nineteen in the class did not
have greater than an 87% on her homework average, however she did make up the
missing assignments the following week. As the weeks continued, many of the students
came back into normal patterns of homework completion and as a result, the class did not
earn the pizza party at the end of January.

Parent Involvement

On random days throughout the month of February, before the students handed in
their daily homework assignment, they were asked to put the name of the person, if
anyone, who helped them with that assignment. They were also asked to put a number
next to the name that would represent on a scale of one to ten, with one being not very
much and ten being a lot, how much that person helped them with that assignment. On
average, 16% of the students received help on their homework from a parent or close
family member, 27% of the students received help from either their math teacher or
another teacher during school hours, 6% received homework from a peer, 38% received
no help on their homework, and the other 13% left their worksheet blank or were absent
on the days this experiment was conducted.

Ticket out the Door

A daily routine for the students in this group is to be given a small piece of paper
that resembles a ticket, in which they have to answer a couple of quick questions based
on that day’s lesson before they can leave for the day. The researcher decided to
manipulate one day’s ticket out the door, to get anonymous feedback on how her students
perceived math homework. The ticket out the door had six questions, but required the
same amount of time as a regular ticket out the door. A sample of this ticket out the door can be found in Appendix I. The results from this survey was that 49% of the students felt that they did their homework all the time, 44% felt they did their homework some of the time, and 7% felt that they never did their homework. Of the students who sometimes did their homework and never did their homework, 24% said they didn’t do their homework because it was too difficult, 19% said they didn’t want to do it, 14% said they lost the homework, and 43% said they forgot that they had homework. When the students were asked on average how long it takes them to complete a math assignment, most students answered time frames between five and twenty minutes, with only two students answering thirty minutes.

Organization

It was acknowledged by the teacher that all students were not always aware that they were missing homework assignments. For example, when looking at the second quarter homework grades in the teacher’s grade book, there were 354 missing homework assignments for the entire group of students. Of these missing assignments, 60 of them were on a day that students was absent or the day immediately following an absence. Therefore, 17% of the missing assignments were not handed because of an absence from school. To further investigate students’ awareness of missing assignments, the teacher gave each of her students a slip of paper of all the missing assignments from that unit. The students were given one lab period as a free period to look through their math binders to find those assignments or extra worksheets were available to complete it. Many of the students were able to find missing assignments in their binders and had
"forgotten to hand it in". As a result of this activity, all students except three increased their overall homework grade for the quarter. However, it should be noted that two of those students were absent on the day they were given the free period to make up the assignments. The percentages for these students' homework grades for unit five can be viewed as (Appendix A) There was also a correlation of students who are classified in the group of never doing their homework as also unorganized students. Three of the five students in this group come to class with mounds of loose papers, stacks of books and in their hands and often cannot find the needed materials for class.
Discussion

The original hypothesis for this research, based on the literature, was that there are many factors that influence a middle school student to do his or her math homework each night. The purpose of this research was to closer examine some of the major influences supported by current research to help the researcher help her students to become more successful. This research was successful in that some ideas from the research were shown to be correct and a larger idea, organization among this age group of students, was shown to be a major factor that was not found in any of the literature found by the researcher.

Targeted Homework

According to the literature by Minotti (2005), when homework that is meaningful and aligned with the individual student’s learning style, the students will be more inclined to complete homework assignments. In the assignments that were analyzed by researcher, the lengthy assignment and the one that appeared to be the most difficult was the assignment that had the lowest percentage of completion. By contrast, the assignment that was the easiest, could be done in the shortest amount of time, Worksheet Day 58, and also included drawing, which would attract a different style of learner, had the highest completion. This made the researcher wonder if students completed this assignment because it involved a different learning style or because it required very little time to complete. The researcher anticipated that assignments that involve real world problem solving would attract students to complete the assignment because they could draw meaning from it and it were not routine problems where the previous question was like
the next question on the sheet, just different numbers. These assignments, *Worksheet Day 47b* and *Worksheet Day 38*, did have more students complete the assignment over *Worksheet p. 164* that was just a drill and practice assignment. However, the survey project only had 75% of the students complete when this was the assignment that was most applicable to the students because they were able to pick their topic and display the data in various choices.

**Extrinsic Motivation**

The results from this study supported Tripp's (1998) and Xu's (2005) research in that most students are not extrinsically motivated and that ideally the goal is to aid students to become intrinsically motivated and that is not done through extrinsic motivation. The research also found that this was a method that many teachers attempt, but very few are successful with on a long term basis. It appeared in this research that extrinsic motivation might be more successful on a smaller time frame, since all students were motivated by the reward for the first week.

**Parent Involvement**

All of the literature on parent involvement by Bempechat (2004), Corno and Xu (2003) and Hong (2004) found that parent involvement was a key factor in developing a student's attitude towards homework and that when there was strong communication between parents and teachers, the students were more successful in all aspects of the classroom, including homework. This research supported the literature in that of the students who were classified as never doing their homework, none of them received
Homework Motivation

parental support on homework assignments. However, it should also be noted that of the 38% of the students who did not receive any help on homework assignments, none of them were classified as never doing their homework. In fact, half of those students were classified as always doing their homework, which would lead the researcher to believe that the homework assignments were on target for ability level. It was disappointing to realize that the majority of the students who required help on homework assignments received help from either the teacher or another teacher in the building. This was supported by the literature by Corno and Xu (2003), in that once students reach the middle school level, their parents feel less capable of helping their students with the assignments they are assigned.

Ticket out the Door

The ticket out the door further supported the researcher’s conclusions about organization playing a role in homework completion at this age group. It was interesting to find that 49% of the students felt that they did their homework all of the time, when according to the researcher’s grade book, only 40% were classified as always doing their homework. This would conclude that students either felt that they did turn in all assignments or have forgotten when they didn’t turn in an assignment. An organization problem is also supported by the findings that of the students who either never did their homework or sometimes did their homework, 57% of them either could not find the homework assignment or forgot that there was homework that needed to be completed.
The researcher found new evidence that organization was a large factor in homework completion for many of her students. The organization piece of homework completion was not found in the literature, even in the articles that discussed the developmental progress of students at this age level. The researcher's results of making the students aware of missing assignments proved to significantly help the students' homework completion. This was supported also in the ticket out the door with many of the students stating that not being able to find their homework and not remembering that they had homework as the main factors in why their homework was not completed.
Conclusion

This research experimented with five aspects of what motivates middle school math students to do their homework in which it was found that the type of homework assignments was a factor in whether or not the students completed their homework. It was concluded that assignments that were shorter in length, appeared to not be difficult to complete, could be related to the students' lives outside of the classroom, and applied other learning styles to the assignment increased homework completion. Extrinsic motivation showed not to be a factor in homework completion that was also supported by the research. However, more research could be done to conclude why students are intrinsically motivated and how to make students more intrinsically motivated because it is the ultimate goal for teachers to make their students responsible for their own learning. Parental involvement also proved to be a factor in homework completion in that those who received help from their parents were more likely to complete assignments. It would be beneficial to continue research in this topic by looking into ways of getting parents more involved in homework assignment and to also investigate parents' opinions about homework and why some choose to be more involved with their student's school responsibilities. The most significant findings were that organization of students in this age group was also a factor in homework completion. These findings would be applicable to all other subjects in the middle school and it would be interesting to investigate how organization also affects student's abilities in other subjects.

It appears that although this research set out to conclude what motivates middle school math students to complete their homework, some parts of this question have been answered, but many still remain. It seems that parental involvement, targeted homework
assignments, being intrinsically motivated, making students aware of missing assignments, and being organized students motivate middle school students to complete math homework assignments.
References


Singh, K., Granville, M., & Dika, S. (2002). Mathematics and science achievement:


### Appendix A

**Excel Document of Homework Grades**

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Appendix B

Worksheet p.53-55

Sample Test Questions

1. Which two figures are the same shape?
   a. Square
   b. Triangle
   c. Circle
   d. Rectangle

2. Which two figures are the same size?
   a. Square
   b. Triangle
   c. Circle
   d. Rectangle

3. This is the same figure as in Question 1. Which of the following is the area of the figure?
   a. 4 square units
   b. 5 square units
   c. 6 square units
   d. 7 square units

4. This is the same figure as in Question 2. Which of the following is the area of the figure?
   a. 4 square units
   b. 5 square units
   c. 6 square units
   d. 7 square units

Short-Response Question

5. Draw your own graph to show how much each item costs.

6. What is the area of the triangle shown?

Answer:

7. What is the name of the shape?

Answer:

8. What is the name of the shape shown?
Apppendix C

Worksheet Day 38

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Use the percent proportion to find the missing value.

1. What is 67% of 500?
   \[
   \frac{x}{500} = \frac{67}{100}
   \]
   \[
   x = \frac{67 \times 500}{100} = 335
   \]

2. What percent of 50 is 54?
   \[
   \frac{54}{x} = \frac{50}{100}
   \]
   \[
   x = \frac{54 \times 100}{50} = 108
   \]

3. 21 is 42% of what number?
   \[
   \frac{21}{x} = \frac{42}{100}
   \]
   \[
   x = \frac{21 \times 100}{42} = 50
   \]

4. What is 250% of 38?
   \[
   \frac{x}{38} = \frac{250}{100}
   \]
   \[
   x = \frac{250 \times 38}{100} = 95
   \]

Use a proportion to solve each word problem.

1. Jason answered 9 out of 12 questions correctly on his math quiz. He needed to score at least a 70%. Did he get a high enough score?
   \[
   \frac{9}{12} = \frac{x}{100}
   \]
   \[
   x = \frac{9 \times 100}{12} = 75
   \]
   Yes.

2. Amelia’s parents say she may watch TV when she has read 80% of her book. She has read 198 out of the 350 pages.
   a. Has she read enough?
   \[
   \frac{198}{350} = \frac{x}{100}
   \]
   \[
   x = \frac{198 \times 100}{350} = 56.3
   \]
   No.

   b. How many more pages must she read?
   \[
   \frac{280}{350} = \frac{100}{100}
   \]
   \[
   x = \frac{280 \times 100}{100} = 280
   \]
   \[
   x = 280 - 198 = 82 \text{ more pages}
   \]

3. There are 33 people at a meeting. Forty people had been asked to the meeting. What percent of the people asked to the meeting are present?
   \[
   \frac{33}{40} = \frac{x}{100}
   \]
   \[
   x = \frac{33 \times 100}{40} = 82.5
   \]

4. Out of 2160 votes, Jock received 1350 votes. What percent of the votes did he receive?
   \[
   \frac{1350}{2160} = \frac{x}{100}
   \]
   \[
   x = \frac{1350 \times 100}{2160} = 62.5
   \]
Worksheet Day 47b

Find the probability of each event.

1. Jim has 4 New York quarters, 3 Pennsylvania quarters, and 3 Virginia quarters in his pocket. What is the probability that he will get a Pennsylvania quarter followed by a Virginia quarter when he pulls two quarters out of his pocket, without replacing the first?

2. What is the probability of rolling an even number on a die and rolling an odd number on a second roll of the same die?

3. What is the probability of drawing a red marble from a bag of 6 red and 4 blue marbles, replacing it, and then drawing a blue marble?

4. On a multiple choice test, each question has five possible answers (A, B, C, D, or E). A student doesn't know the answers to two questions, so he guesses. What is the probability that the student will get both answers wrong?

5. Bree wrote the letters SCIENCE on cards and placed them in a hat. What is the probability she picked two cards with C written on them if she drew the second card before the first card was put back in the box?
Appendix E

Worksheet Day 58

Name: Key
Math 7
Prisms and Cylinders

Sketch the solid.

1.) Triangular Prism
2.) Cylinder
3.) Pentagonal Prism
4.) Rectangular Prism
5.) Hexagonal Prism

What figure can be formed from this set?

6.) Rectangular prism
7.) Cylinder
8.) Triangular prism
9.) Cube
Appendix F
Worksheet p.164

Find the surface area of a cylinder with the given dimensions. Use 3.14 for \( \pi \). Write your answer using the smaller unit.

10. Radius: 2 cm
    Height: 5 cm
    \[ SA = 2 \pi r^2 + 2 \pi rh \]
    \[ SA = 2(3.14)(2^2) + 2(3.14)(2)(5) \]
    \[ SA = 25.12 + 62.8 \]
    \[ SA = 87.92 \text{ cm}^2 \]

11. Radius: 3 in.
    Height: 4 in.
    \[ SA = 2 \pi r^2 + 2 \pi rh \]
    \[ SA = (3.14)(3^2) + 2(3.14)(3)(4) \]
    \[ SA = 28.26 + 75.36 \]
    \[ SA = 103.62 \text{ in}^2 \]

12. Radius: 12 cm
    Height: 1 cm
    \[ SA = 2 \pi r^2 + 2 \pi rh \]
    \[ SA = (3.14)(12^2) + 2(3.14)(12)(1) \]
    \[ SA = 452.16 + 75.36 \]
    \[ SA = 527.52 \text{ cm}^2 \]

13. You are decorating the hat box shown. If you cover all but the bottom of the box in fabric, how much fabric do you need?

14. A soup can has a diameter of 80 millimeters and a height of 125 millimeters. What is the surface area of the soup can?
    \[ SA = 2 \pi r^2 + 2 \pi rh \]
    \[ SA = 2(3.14)(40^2) + 2(3.14)(40)(125) \]
    \[ SA = 40192 + 31400 \]
    \[ SA = 71592 \text{ mm}^2 \]

15. A builder is painting the support columns for the front porch of a house before they are installed. There are four columns and they are each 15 feet tall and 4 feet in diameter. How much paint do you need to completely cover all four columns with one coat of paint?

   \[ SA = 2 \pi rh \]
   \[ SA = 2(3.14)(4)(15) \]
   \[ SA = 28.26 \times 15 \]
   \[ SA = 423.9 \text{ ft}^2 \]
Appendix G

Survey Project Rubric

Name ___________________________________________ Period __________

Step 1: Select a topic or choose your own with teacher approval. Explain why you chose this topic (5 points)
Points Earned ____________

Step 2: Prepare 4 survey questions. You must have one of each: multiple-choice, short answer, fill-in-the-blank, and numerical format. Questions must also be unbiased. (5 points)
Points Earned ____________

Step 3: Explain the sample you are going to use; random, systematic, or stratified and must represent the population appropriately. (5 points)
Points Earned ____________

Step 4: Explain how you are going to organize and collect your data. (5 points)
Points Earned ____________

BEFORE you begin step 5, you must conference with the teacher.

Step 5: Show all appropriate work for collecting the data. (5 points)
Points Earned ____________

Step 6: Make a Frequency Table to show your data and then choose either a Histogram or Circle Graph to display your data. You do not need to display all of the data you collected; you can focus on one particular survey question and display the data from that, if you choose. Be sure to display your data in a very neat and organized fashion. Make sure the information you are sharing is clear and correct. Be sure to label all displays. (10 points)
Points Earned ____________

Total Score (out of 35 points) ____________

Percent Score ____________
Appendix H

Survey Project Outline

Math 7 Name __________________________

Survey Project Date __________ Per. __

Step 1: Select one of the following topics to conduct your own survey (or choose your own topic with teacher approval). Explain why you chose this topic. (5 points)

• Favorite Television Shows
• Favorite Fast-food Restaurants
• Favorite Sports

Step 2: Prepare four (4) survey questions related to your topic. The questions should be created using the multiple-choice, short answer, fill-in-the-blank, and numerical formats. (One of each type of question) The questions should be unbiased. (5 points)

Step 3: Determine the sample you are going to use. You must survey a minimum of 20 people. What type of sample is it (random, systematic, or stratified)? Does this sample represent the population appropriately? Explain. (5 points)

Step 4: Decide how you are going to organize and collect your data. (5 points)

BEFORE you begin step 5, you must conference with the teacher.

Step 5: Conduct your survey and collect your data. (5 points)

Step 6: Make a Frequency Table to show your data and then choose either a Histogram, or Circle Graph to display your data. You do not need to display all of the data you collected; you can focus on one particular survey question and display the data from that if you choose. Be sure to display your data in a very neat and organized fashion. Make sure the information you are sharing is clear and correct. Be sure to label all displays. (10 points)

You must turn in:

1) A written paper that includes the following information:
   • Topic chosen and reason why
   • Your four survey questions
   • A description of your sample, the type of sample it is, and explanation of why this sample represents the population
   • All collected survey data
2) A final data display (such as a poster)
   • Be sure information is presented neatly and accurately
Appendix I

Ticket Out the Door

Ticket out the Door

1. On a scale of 1 to 10, with one being not at all and ten being all the time, how often do you do your homework?

2. Which of the following choices is most true about you when you didn’t complete a homework assignment:
   a. It was too difficult
   b. I couldn’t find it
   c. I always do my homework
   d. I forgot we had homework
   e. I didn’t want to do it
   f. Other: ____________________________

3. On average, how long does it take you to complete a homework assignment?

4. On average, who helps you with your homework and on a scale of one to ten, with one being not at all and ten being a lot, how much does that person help you?

5. Do your parents check your math homework? If so, how often?

6. What is one thing you would change about math homework assignments (other than not having any homework at all)?