THE EFFECTIVENESS OF HOMEWORK IN A 6TH GRADE ELEMENTARY SCIENCE   
CLASSROOM

by

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of

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DEDICATION

This capstone research is dedicated to my family, my biggest cheerleaders throughout this process. Their unwavering support and love have been my strength. I dedicate this to my mother, who has constantly encouraged me throughout my educational career. To my daughter Katie, who has witnessed my academic journey and understands that learning is a lifelong process. We can say we did this together as you have listened and, at times, guided me through the process. To my son-in-law, Dan, whose advice and answers to my questions have been invaluable. To my sister, Gale, who has always inspired me to be a lifelong learner. My family's love and sacrifice motivate me to discover more of myself. Lastly, I dedicate this to all my students, who I hope will never give up on the discovery and learning process. Go out there and find your passion.

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ABSTRACT

Many educators and parents have debated the necessity of homework. Research studies completed in the past ten years analyzed whether homework benefited all grades' assessment scores, specifically in math and language arts. School districts throughout the United States have weighed in on whether or not homework is effective on student testing and whether or not homework is necessary. It is becoming increasingly popular for school districts to question the validity of homework rather than assigning their students homework. This study aimed to research whether homework in a sixth-grade general education self-contained elementary classroom affected student learning in science, as evidenced by increased science assessment scores. This study also includes a qualitative analysis of students' and parents' attitudes toward science homework. Students were given science homework two to three nights weekly for five weeks. After completing the homework assignment, students were given a weekly short assessment to test their knowledge. Following the weekly assessment, students were given a post-assessment survey to rate their attitude toward the homework. Analyses of the quantitative results indicated there was a minimal increase in scores. The analysis of the qualitative results indicated the students' attitudes, where they did not enjoy doing science homework, and parents saw homework as beneficial.

CHAPTER ONE

INTRODUCTION AND BACKGROUND

Context of the Study

Lompoc, California, is nestled on the Central Coast of California. It is a medium-sized rural city ten miles from the Pacific Ocean. According to the U.S. Census Bureau, it has a population of 43,834. The Lompoc community is known for its year-round agriculture, Federal Correctional Complex, and Vandenberg Space Force Base, formerly Vandenberg Air Force Base. Vandenberg (VSFB) plays a vital role in our community. The base launches rockets for the military and private companies, which include NASA, Rocket Alliance, Space X, and Lockheed Martin. These private companies recruit nationally, bringing specialized individuals to the central coast and bringing temporary and permanent employees from all over the country, influencing our school district. These companies are willing to come to our schools for presentations and offer hands-on space industry learning experiences. For example, all 5th-grade students are invited to attend a one-week star-based science program hosted by the VSFB. This is an interactive, hands-on science, technology, engineering, and math program for students.

The Lompoc Unified School District (LUSD) has two high schools, Cabrillo High School and Lompoc High School, with specialized science programs. Cabrillo High School focuses on the life sciences and has a state and nationally recognized aquarium on campus, which its students operate. Lompoc High School strongly emphasizes agriculture, drafting, and engineering programs.

According to the LUSD, the district office educates approximately 9,231 students. The district has ten elementary schools, two middle schools, two high schools, and two alternative high schools. LUSD has a relatively diverse student population, with 70% of pupils being Hispanic, 20% White, 4% two or more races, 2% Asian, and 4% all other races ([www.usnews](http://www.usnews) education). Sixty-four percent of the pupils are socioeconomically disadvantaged, and 23% are English Language Learners. This school district has no homework policy. Homework is up to the discretion of school administrators and teachers (www.lusd.org).

Miguelito Elementary School is one of the ten elementary schools within the district. This is the location of the students being studied. It operates on a traditional August through May calendar rather than a year-round schedule. Miguelito’s location differs from the other nine schools as it is more secluded than others. The school sits on the southwest edge of town, facing towards the Space Force Base. This unique location allows students to witness rocket launches while they are at school. Miguelito overlooks a large agricultural field where students occasionally take tours to learn about plant and soil science.

I have been a certificated K-8th grade teacher for the past eighteen years. Twelve of those eighteen years have been at Miguelito Elementary School, where I taught fifth and sixth grade. I am currently teaching a sixth-grade general education self-contained classroom, where I teach all subjects. I focus on Project-Based Learning, which involves engaging students in the real world and making projects more personal and meaningful.

In my classroom, we have access to flexible seating, making it easier to regroup for different subjects. I also run an after-school STEAM Club for sixth graders. Twenty-four students regularly attend STEAM Club. Four of those students are in my class. When teaching science in my class, students work in groups of two to three inside the classroom. I teach science lessons twice a week for an hour and a half. The group of students I have had little exposure to science. Most of their science has been from online programs or reading about a topic in science.

LUSD is a one-to-one student-to-computer (Chromebook) ratio from transitional kindergarten to sixthgrade. LUSD and California State Assessments are completed digitally from first grade up. Students can only take home their Chromebooks if parents sign for one. However, many parents do not have WIFI, nor can they afford WIFI, and therefore, homework is not assigned online. Homework that requires the internet at home for elementary students is not advised by school administrators and district leaders (T. Wall personal correspondence January 11, 2024). Even though our school has a one-to-one computer allotment to make education equitable and accessible, I cannot assign homework online because some students do not have internet services at home.

According to the California Department of Education, Miguelito Elementary School has a population of approximately 643 students. Lompoc Unified School District is a Title 1 school district. All schools within this district fall under Title 1. All students receive free breakfast and lunch. At Miguelito Elementary School, 64% of the students are socioeconomically disadvantaged, and 14 % are English Language. (<https://www.caschooldashboard.org/reports/42692296068902/2023>). At the time of this study, Miguelito Elementary School was on the state watch list for not meeting Adequate Yearly Progress (AYP) two years in a row. Miguelito had made growth overall but not in their subgroups. (Winkler, A. personal correspondence, 2023).

Before IRB approval, a survey was conducted of all Miguelito Elementary School teachers, and the results revealed that teachers would only give homework in the science area if it was a reading passage worksheet. According to the teachers surveyed, fifth-grade teachers did not assign any homework. All learning was classroom-based. However, they were and are tested on their science standards at the district and standard state levels. Students at Miguelito Elementary School who have yet to experience doing homework found it difficult to do homework in the sixth grade. I observed, before the IRB approval, students experiencing anxiety, frustration, anger, and lack of motivation to do any homework.

Focus Statement/Question

My focus question was: How does homework affect elementary school science classroom student learning?

CHAPTER TWO

CONCEPTUAL FRAMEWORK

Positive Effects Homework has on Student Learning

It is a popular belief that homework is synonymous with education. The concept of homework has existed for hundreds of years. In Ancient Greek times, Plato and Aristotle assigned homework to their students (Foreman, A. 2023). In modern times, students globally have some homework to do after school.

Homework has been defined in many different ways by academia. Researchers in the academic field have defined homework to their specification; however, when one looks at the definition of homework, it can be defined as an out-of-class academic spiral learning activity, enhancing critical thinking skills activity, or preparing for class the next day by analyzing the teacher's lesson activity. Educational institutions use homework to promote or review the academic work that can and was being given to a student (Hong & Lee, 2000). For many years, homework has been considered crucial in the overall learning process and has a long-term impact on academic and non-academic abilities. The goal of homework is for students to develop skills, seek information, and research a topic that may not be covered in class. It also aids in showing students that learning is possible outside the confines of the school walls and that students can use their imagination to think critically about the world around them. Many people still believe that homework can positively affect students’ success in the classroom regarding testing (Valle, Regueiro 2016). Further, people believe homework is a way to build knowledge and even apply the knowledge that they have gained in school. Many parents attribute students’ success to the amount of homework assigned. It is believed that well-organized homework can make students more responsible and teach self-discipline in any skill they are learning. It fosters independent learning and develops responsible character traits. It also informs the parents of what their student is learning and allows them to monitor their child’s progress. One of the benefits of homework is that it can help students with their problem-solving skills (Holland & Courtney, 2021). It also can teach time management while they are at home. Lastly, for students interested in a subject, it can widen their horizons by giving them the time to explore the subject more in-depth than the time constraints they have in the classroom. Broadening one’s horizons can help prepare a student for the complexities of our competitive real world (Sallee & Rigler 2008).

Parent views on homework affect the student’s success in homework, performance and progression (Cooper et al., 2000). If homework is well organized, it increases student’s success. It teaches students to be more successful, self-disciplined, and responsible, and it teaches critical thinking skills (Caglayan, 2002). Homework can help build, foster, and reinforce self-discipline. These things can create autonomous learning for students and help them become lifelong learners ( Davidovitch & Yavich, 2017). Most importantly, homework can foster independent learning. Homework in the science classroom needs to have an intrinsic purpose and be meaningful for students to be successful.

For a teacher, homework can be seen as a way to share a class experience. It can also introduce new content to their students and give a sense of independence to students who may not have this or even a time for reflection. Lastly, homework is used to get through the content they cannot complete in the classroom setting. In 2015, a study was conducted where sixth-graders who had worked on math assignments outside of the classroom for a specific purpose positively impacted academic achievement (Roasrio et al., 2019). One study concluded that homework was beneficial to students. However, the amount of homework one completes is not the key to success. What makes a student successful while doing homework is how a student is in engaged when doing that homework. Engagement in homework helped students to be able to analyze and problem-solve on a much higher level rather than doing rote work (Trautwein et al., 2009; Nunez et al., 2015).

Students' engagement and how they view homework are essential for student success. For homework success, this can be broken down into four areas: academic, behavioral, cognitive, and emotional. Looking at the educational and emotional view of homework, this can be considered intrinsic and extrinsic. Students who have an inherent view of homework are more likely to be focused on learning the given content and will do the homework willingly so they can understand. Those students who take an extrinsic approach are doing the work for some type of reward, such as playing outside, playing a video game, or getting a good grade (Cooper & Lindsay, 1998).

Another factor in homework success is feedback directly from the instructor. Feedback can be considered an important tool for redesigning homework. When teachers can provide feedback on homework in a timely matter, students can interact with the teacher on the homework to see what they have/can improve upon (Cunha et al., 2018).

From this, it can be gathered that many parents want their students to have some homework. They feel that homework helps with boredom and getting into trouble after school. These parents see homework as an opportunity for their students to get ahead or as part of their student’s academic learning (Wu et al., 2022).

In one study, high school students who did their homework outperformed their non-homework peers by 75%, and it was about half for middle school/junior high. When another survey was done, it found a correlation between students who did more homework, had more outstanding test scores, and class grades (Urauchi & Tanno, 2022). Meanwhile, there was a slight gain in test scores in grades six through nine. Students in middle school/junior high to high school benefit more from homework than those in lower grades (Cooper, 1989).

Negative Effects of Homework

Just as homework is synonymous with education, to some, homework is synonymous with drudgery, punishment, and an unnecessary burden to educators and parents. Many students across the nation view homework as a drudgery. Homework is a cause of mental and physical fatigue, and the very idea for some, homework provokes frustration and anxiety to the point that it is counterproductive (Wilson & Rhodes, 2010). Parents get frustrated with the constant battle over homework and end up doing the homework themselves. This can lead to some children avoiding school altogether, negatively impacting student success (Oram & Rogers, 2021).

One concern for parents is that many students spend more than forty hours a week on school and homework. This is the same amount of time as full-time employment as an adult. The belief of these parents is that students cannot be children because they are consumed with schoolwork. Parent attitudes toward homework directly impact student homework completion and success (Grinshtain & Harpaz, 2021). Parents and students may feel that great amounts of homework or doing any homework is deemed a punishment and target the teacher as the bad guy.

 This sparked heated discourse in the education community regarding if homework was necessary to improve test scores. Studies that looked at homework quality, quantity, and usefulness in a child’s education deemed homework unnecessary. In addition, the results of the studies determined that homework was a burden to both educators and parents. This debate spilled onto social media, with many more parents and educators questioning the need for homework. Some studies have found homework to decrease students' test scores (Davidovitch & Yavich, 2017).

Parent help and student success are correlated to academic success (Bodovski, 2010). A parent from an affluent suburb of Houston, Texas, was interviewed. The school district her children attend has banned homework. Her children did well on state testing; their school is recognized in Texas for their academic achievement. She stated, “I love that my children have no homework. We can spend time as a family and get other things done” (Johnson, J. personal correspondence, Feb. 2024). Families with higher incomes have higher academic success because they can get help if their students struggle. Statistics show that parents with higher levels of education have a stronger ethical belief in educating their children. (Hofferth & Sandberg, 2001).

Many parents of Title 1 schools felt homework to be inequitable. They couldn’t compete with wealthier families who have the means to help their students, such as after-school homework tutoring or WIFI.

Reasons Why Students Do or Do Not Do Homework.

Title 1 schools are at high risk for students' inability to complete homework assignments. Some students do not have access to help, such as tutors, that may be needed to accomplish their homework. Homework that compliments the curriculum does not always fulfill the needs of the students. Some of these students live without the basic necessities, adequate food, water, and a place to sleep. Living quarters may be small and cramped with multiple families living together, which is common in the area where this study was conducted. Many of these homes have no space for young students to study and focus. Many migrant agricultural working parents work and travel long hours each day and cannot offer the help needed to complete homework assignments.  These conditions influence why these individuals do not complete homework.  Due to these differing economic and home conditions, some students need supplies such as technology, markers, and transportation to work on group projects and, therefore, rely on copying others to accomplish the work and get it turned in (Ballee & Rigler, 2008).

Language barriers for many migrant parents and their students hinder learning and advancement, preventing Title One families from seeking help from outside sources or even the teacher. Immigrant families are less likely to have cultural knowledge of school assignments and school choices.  These systems can be hard to understand for people born into them, much less a family new to the country. Neighborhood segregation often pushes immigrant families toward lower-quality, segregated schools (Greenberg et al., 2021).

Assigning Classwork as Homework

In today’s academia at the elementary school level in the United States, teachers are pressured to teach all the curriculum required for district or state testing to all students at all academic levels. The pressure to complete the curriculum required of an elementary school teacher can be challenging. Classwork is assigned as homework to cover everything that needs to be taught. Teachers are overwhelmed by their workload and are held responsible if the school does not make Adequate Yearly Progress (AYP) (Standford, 2023).

Since the Space Race started in the late 1950s, when the Russians launched Sputnik and shocked Americans out of complacency, there has been a push for teaching students science and math. Congress quickly passed a $ 1 billion education spending program. Thus, homework became the mantra (Foreman, 2023). Teaching science was and is still viewed today as important because our country needs graduates to enter competitive STEM field careers, making discoveries that will impact our environment and health for the betterment of our society. Schools nationwide held and still hold annual science fairs, attend science camps and participate in field trips to science museums to create unique and exciting learning opportunities.

In the state of California, teachers are required to teach 6th-grade students 220 minutes of science a week (A. Winkler 2024, Personal Correspondence). However, this frequently does not happen. Due to time constraints, insufficient budgets, and insufficient training in science, teachers are not always able to incorporate science lessons into their daily routines. They may send the required lesson home as remedial worksheets that do not require students to think on a higher level but as a review of a science topic (LUSD Survey of Teachers, 2024).

In 2019, a new set of standards called the Next Generation Science Standards was implemented nationwide. The National Assessment of Educational Progress predicted that this new program would improve science test scores. However, they have not yet seen that prediction (<https://nces.ed.gov/nationsreportcard/science/> ). For example, in 2022-2023 77% of 5th grade students at Miguelito Elementary School did not meet the state science standards, and 78% of all 5th, 8th, 11th, and 12th-grade students attending an LUSD school did not meet the state standards in science (Table 1) (Wall, T. District office, personal correspondent).

Table 1 . LUSD student data from the 2022-2023 California State Science Testing

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | MIGUELITO | DISTRICT | | | TOTAL |
| Achievement Level | # of Students  (5th grade) | # of Students  (5th grade) | # of Students  (8th grade) | # of Students  (11th and 12th grade) | All Grade Levels |
| 1 | 17 | 130 | 211 | 55 | 413 |
| 2 | 43 | 287 | 341 | 354 | 1025 |
| 3 | 13 | 86 | 85 | 165 | 349 |
| 4 | 6 | 24 | 24 | 34 | 88 |
| No Score | 1 | 5 | 21 | 62 | 89 |
| # Students Tested | 80 | 532 | 682 | 670 | 1964 |

CHAPTER THREE

METHODOLOGY

Demographics

The Montana State University’s Institutional Review Board exempted this project's research methodology, and compliance with work with human subjects was maintained (Appendix A). Demographics in this case study, 27 students and 24 parents consented to participation. Twelve females and fifteen males were in my sixth-grade class at Miguelito Elementary School in Lompoc, California. Sixty-seven percent of the students were Hispanic, 32% were white, 1% were Asian/Pacific Islander, 1% were African American, and 5% were two or more ethnicities.

There were three level three English Language Learners, which meant they were almost proficient English speakers, and two Level one Beginner English Language Learners, which included a new student from Central America whose primary language was Spanish. Three of these five students were able to receive help from parents on their science homework assignments. Five students were on an Individualized Educational Plan (IEP) where classwork and homework were modified to support their learning. During this study, three out of the five students with IEP accommodations received some help at home in completing their assignments.

According to the Northwest Evaluation Association (NWEA) Measures of Academic Progress (MAP) test at the beginning of the year, 75% of the students in my class were below or far below in math, and 42% were below or far below in reading.

Treatment

The study used four treatments that adjusted how homework was administered to my students. The first treatment was I did not change my classroom instruction. The second treatment was administering science homework to students with little to no science homework experience. The third treatment was to motivate students to do their homework. This was done by giving tips and tricks to get students motivated. An example was giving positive feedback on their homework assignments, doing daily agenda checks to see if they wrote them in their agenda books, and teaching them what to do if they did not understand a question. The fourth treatment was to reduce student anxiety. This was done by assignments taking under thirty minutes, introducing anxiety-reducing techniques, and using paper and pencil for assignments and assessments at their request (Table 2).

Table 2. Treatment Table

|  |  |  |  |
| --- | --- | --- | --- |
| **Treatment 1** | **Treatment 1** | **Treatment 2** | **Treatment 3** |
| The way the science lesson plans were taught did not change. | Administer science homework to students with little to no science. | Motivate students to do their homework by giving them tricks and tips. | Reduce Student anxiety by reducing homework to under 30 minutes. |

Data Collection and Analysis Strategies

Family Homework Survey

Parents were administered the eighteen-question Family Homework Survey in English and Spanish (Appendix B). The survey was developed by Aladag and Dogu in (2009). The original survey had twenty-three questions and was geared toward students. The parents' questions in the Family Homework Survey were modified to eighteen questions. The questions were modified to fit the needs of my parents. This survey aimed to analyze parents' thoughts and feelings toward their students having science homework. The survey was administered in English and Spanish. Parents were asked to rate their perceptions on a 5-point Likert Scale for qualitative analysis. They could Strongly Agree (5), Agree (4), be Uncertain (3), Disagree (2), or Strongly Disagree (1). The Family Homework Survey included positive and negative questions about homework. This was to analyze parents' feelings towards their students' science homework. Analyzing a parent's perception and attitude toward homework helps an educator understand what is expected of a student in the home. The answers from the survey will be compared to what students have answered in their survey to analyze parents' and students' perceptions. I analyzed the data from these surveys using Microsoft Excel and quantified it into statistical bar graphs showing means.

Room 9 Student Survey

Students were administered an eighteen-question Room 9 Student Survey. (Appendix C). The survey was developed by Aladag and Dogu in (2009). The original survey had twenty-three questions focused on student's thoughts on homework. The Room 9 Student Survey was modified to eighteen questions. This survey analyzed students' thoughts and feelings toward science homework. Students were asked to rate their perceptions on a 5-point Likert Scale for qualitative analysis. They could Strongly Agree (5), Agree (4), be Uncertain (3), Disagree (2), or Strongly Disagree (1). The Room 9 Homework Survey included positive and negative questions about homework. This was to analyze students' feelings towards their students' science homework. Analyzing a student's perception and attitude toward homework helps an educator understand what a student is thinking and how they perceive homework at home. The answers from the survey will be compared to what students have answered in their survey to analyze parents' and students' perceptions. I analyzed the data from these surveys using Microsoft Excel and quantified it into statistical bar graphs showing means.

Homework

The following data instrument was used to collect homework assignments and weekly assessments. Homework was given two to three times per week. Each week, students were given different types of homework to evaluate their attitude, confidence, and ability on the homework. Students were given a 5 for turning in partially or entirely completed work and a “0” for not turning any homework in. Teacher feedback was given to students on the homework. Students were given their homework back. The data from this survey was analyzed using Microsoft Excel, which quantified the data into statistical bar graphs, both raw and average scores. It was analyzed against assessment scores for that week.

Weekly Assessments

A ten-question weekly assessment called the Weekly Assessment is at the end of each week (Appendix C). Each Weekly Assessment included multiple-choice, true-false, and fill-in-the-blank questions. Each question was worth one point for a total of ten points. In week three, there were more fill-in-the-blank questions without reference keys to terminology. This was used to analyze how students did with different styles of assessments at their level of thinking. The data was analyzed against student homework to see if those had done their homework and their assessment scores. The data from this survey was analyzed using Microsoft Excel. I quantified the data using Microsoft Excel and divided it into statistical bar graphs showing means.

Post Assessment Student Survey

The last data collection instrument was a Post Assessment Student Survey (Appendix D). A ten-question survey was given to students. There were three open-ended questions for students to complete to express their feelings about having to do science homework. The survey was directly geared toward students’ attitudes toward science homework for that specified week and their feelings about it. I then analyzed the data against the homework and assessment scores to determine whether homework helped or hindered a student's ability. The data from this survey was analyzed using Microsoft Excel. I quantified the data into statistical bar graphs, and the quantitative data was written into quotes each week.

Table 3. Data Triangulation Matrix.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Research Question | Data  Source 1 | Data  Source 2 | Data  Source 3 | Data  Source 4 | Data  Source 5 |
| How does homework affect elementary school science classroom student learning? | Qualitative Data Family Homework Survey. | Room 9 Student Homework Survey | Room 9 Student Homework will be given in various ways to analyze student engagement. | Weekly Assessments will be given on what was being given to assess knowledge learned at home and in the classroom. | The Post-Assessment Survey analyzes students' thoughts and feelings on homework and assessments for that week. |

CHAPTER FOUR

DATA ANALYSIS

Results

Family Homework Survey

The Family Homework Survey was administered to parents to determine their perceptions of homework. Twenty-four (*N*=24) out of twenty-seven parents (89%) participated in the survey. The results of the Family Homework Survey indicated that parents either strongly agreed or agreed with most questions. The responses to 67% of the survey questions were favorable to homework. When parents were asked if their students had great fun while doing homework given in the science classes (Q1), 67% of parents agreed or strongly agreed. Parents saw homework as needed and useful to their child’s education. When comparing questions that refer to science homework playing a major role in their understanding of the course subject (Q2), 79% of parents agreed. Forty-two percent of parents believed homework should not be optional (Q3).

When asked if the correction of homework given in science classes significantly contributes to correcting mistakes (Q4), 94% of the parents agreed. When asked if correcting homework given in the science class promoted communication between teacher and student (Q5), 96% of the parents agreed. Ninety-six percent of the parents also agreed when asked if homework is more beneficial if given concurrently with what is taught in class (Q6) (Figure 1).

When comparing whether homework should be done in the classroom (Q10) to whether homework should be optional (Q3), 67% of parents agreed that homework should be done in the classroom, yet 40% disagreed that homework should be optional. The results were similar when comparing closely related questions, such as whether homework helps with the imagination (Q12) and whether homework helps with creativity (Q16). Parents believed that science homework is better at improving the imagination than creativity (Figure 1).

Figure 1. Family Homework Survey responses, (*N*=24). *Note:* Q1: My students have great fun while doing homework given in the science classes; Q2: I think homework given in science classes has a major role in my student's understanding of science course subjects; Q3: Homework given in the science classes should be optional; Q4: Teachers' correction of homework given in science classes significantly contributes to correcting mistakes; Q5: Correcting homework given in science classes promotes communication between the teacher and the student; Q6: It will be more beneficial if homework given in the science classes is given in accordance with the course subject covered; Q7: My student tries to be attentive to homework given in the science class; Q8: Among homework given at school, my student receives homework in their science class; Q9: Tests given as homework in the science class help students prepare for exams; Q10: It is more appealing if homework given in the science class is to be done in the classroom; Q1: My student enjoys researching information for their science homework; Q12: I believe that homework given in science classes improves my student’s imagination; Q13: I think if my students' homework is given in the science class for group work, they will acquire more consistent knowledge; Q14: Homework given in science classes as preparatory work makes a student more willing to learn the course subject; Q15: Homework given in science classes as an exercise enables a student to understand and comprehend the course subject better; Q16: I think homework and projects given in the science classes do not improve my student’s creativity; Q17: If homework given in science class is related to current issues, my student is more willing to do it; Q18: I think the assessment of homework given in the science classes should affect the final grade that the teacher gives.

Student Attitude Towards Homework

The results of the Room 9 Student Survey indicated that student attitudes about homework varied, with many being neutral about questions (*N*=26). Students were asked if they had great fun while doing homework given in science class (Q1), and 46% agreed, 8% were neutral, and 37% disagreed with this statement. There was almost a split in the classroom regarding the enjoyment of homework. When asked if homework given in science classes plays a role in understanding the subject matter (Q2), 44% agreed, 4% were neutral, and 35% disagreed with this statement. Students were asked if homework should be optional (Q3), and it was reported that 44% agreed, 12% were neutral, and 23% percent disagreed (Figure 2).

When asked if a student was more willing to do science when it is related to other subjects (Q8), the results varied, with a majority disagreeing with this statement. As opposed to when asked if out of all homework given at school, a student is more willing to do the science homework (Q9), it was observed that the majority agreed with this statement. There was a 34% increase in students who preferred science homework over other subjects (Figure 4).

Most students agreed that corrections to homework given in science class help them talk between teachers and students. However, four percent agree that homework can affect their final grade in science class. Graded homework needs to be returned promptly so that students can engage with the teacher and their peers regarding the subject matter at that time. Notably, forty-two percent of sixth-grade students are neutral regarding homework affecting their grades (Figure 2).

Figure 2. Room 9 Student Survey responses, (*N*=26). *Note:* Q1:I have great fun doing the homework given in my science classes; Q2: I think homework given in my science classes plays a role in my understanding of the science course subject; Q3: Homework given in my science class should be optional.; Q4: Teacher feedback on homework that is given in science class can make a difference in my learning; Q5: Corrections to homework given in my science class help me to be able to talk between teacher and student; Q6: It is helpful if the homework that is given in the science class is the same as the subject covered in class; Q7: I try to pay attention while doing homework given in my science class; Q8: I am more willing to do my science homework when it is related to other subjects.; Q9: At all the homework given at school, I do the homework given in my science class; Q10: I am more willing to do my homework in my science classes when the homework is based on research; Q11: I am willing to do my homework if my science homework correlates to my test; Q12: I like doing homework in science when I am able to use multimedia such as TV, the internet, videos, etc.; Q13: I believe that homework given in science class improves my imagination; Q14: I think if my science homework were given as group work, I would gain more knowledge on the subject; Q15: Homework given in the science class on a subject we are about to learn, makes us more willing to learn the course subject; Q16: Homework given in the science class as an exercise helps understand and comprehend the subject better; Q17: If homework given in science class is related to current issues, I am more willing to do the homework; Q18: I think the grading of homework given in science class can affect the final grade that the teacher gives.

Parent and Student Data Analysis

The data between parents and students was examined, and when both groups were asked if students had fun doing homework, 66% of the parents agreed, whereas 46% of the students agreed (Figure 3). There is a lack of communication between parents and students' feelings when it comes to homework.

Figure 3. Parent and student perceptions of science homework (N=24 parents; N=26 students).

Students and parents were asked if they believed homework given in science classes has a significant role in students' understanding of their science subjects (Q 2). The parents had seventy-nine percent believe in this statement, while only fifty-four percent of the students agreed (Figure 4). Parents' feelings towards homework are seen as beneficial, but students do not see how homework helps with their understanding of a concept.

Figure 4. Perception of Science Homework Parent Vs. Student.

When asked if homework should be optional (Q2), twenty-nine percent of parents agreed with this statement, while students responded with an overwhelmingly sixty-one percent agreement. Those that were neutral to this question were twenty-five percent for parents and twelve percent for students. Parents and students share different views on how homework should be handled.

When parents and students were asked whether homework should affect their final grade (Q18), forty-two percent of students agreed, while only twenty-five percent of parents agreed (Figure 5). Parents and students value how homework should be handled in the classroom. Students think homework should be optional but that if they are going to do it, it should affect their final grade, whereas parents believe homework should not be optional, but homework should not affect their student's final grade.

Figure 5. Perception of Science Homework’s effect on student understanding Parent Vs. Student.

When asked if teacher feedback on homework makes a difference in learning (Q2), ninety-two % of parents and sixty-two % of students agreed. However, for disagreeing, zero percent of parents disagreed with this statement, while twenty-three percent of students disagreed. Parents see the benefits of teacher feedback, yet some students need help understanding if feedback on homework can help them.

Analyzing whether homework improved the imagination (Q12 on the parent survey & Q13 on the student survey) Ninety-one percent of parents agreed, while only thirty-one percent of students agreed (Figure 6).

Figure 6. Perception of science homework’s effect on student understanding.

Comparison of Homework to Test Scores

The data for the five weeks of homework and assessments remain studied together (Figure 7). In Week One, there is a slight gain in assessment scores. In week two, the average homework and assessment scores were almost the same percentage. In Week Three, the assessment scores dipped below the average of the homework average. When homework was changed in Week Four, did you see a gain in their assessment scores? By Week Five, students' homework and assessment scores were averaging the same again. It wasn’t until week four that assessment scores improved. Homework had little effect on evaluations.

Figure7. Class Average assessment and homework scores each week.

When analyzing the data throughout the five weeks, students were asked which asked if the science homework helped them during their class instruction (Q5), which showed that most students stayed neutral. Only in Week Three did it change a small amount (Figure 8).

Figure 8. Comparison of the five-week post-assessment survey on whether homework helps instruction.

Week two saw a slight increase in homework, with sixty-two percent of students turning it in. The class average for the assessment was sixty-two percent, a slight increase from the week before. The post-survey was positive. However, many students felt neutral about whether the homework helped during class instruction. Yet, an overwhelming number of students agreed with question four that the homework helped them with what they were doing in class. Students felt that the homework helped them on the test. “The test didn’t seem to be that hard.” “I liked how I got to learn something new.” “The quiz didn’t make sense.”

Week Three had the lowest scoring for homework, with an average of sixty percent of students turning it in. With this, the average student assessment scores were at the weakest of sixty percent. Over half the questions were fill-in-the-blank with no word bank. Week Three homework focused on long reading passages and answering questions complex questions from the passages. In the Week Three survey, many respondents stated, “The homework took a long time.” “I did not get through the homework.” I did not understand the homework or the quiz.” “Why did we have this for homework?” “I like learning about glaciers. The information was interesting.” “It struggled on the test.” “Why did you give us this type of homework Ms. Wear? It took forever to do.” Yet, even with the survey staying consistent, students struggled with the assessment

Week Four saw increased participation in homework and assessment scores. Eighty percent of the students did their homework, and the average score on the assessment was eight percent. This was an increase from the week before. Looking at the homework and how they had to do an activity at home where they were looking at the world around them, using multimedia, and making observations about the world around them could have made a difference. When reading through the comment section on their assessment, students stated, "The homework this week was fun.” “The homework took a bit longer, but I didn’t mind because I could be on the computer.” “Can we have more homework like this?” “Ms. Wear, can I ask you a few other questions I observed?” On the survey, question five dealt with homework and helped students during instruction, and the neutral percentage shrunk. Students seemed to enjoy homework that was more of a meaningful real-world assignment.

In Week Five, an average of seventy-five percent of the students turned it in, and the average grade on the assessment was also seventy-five percent. Even though assessment scores had a slight dip from the past week, student scores were still higher when students were assigned to use multimedia, observed within our town, and explored the subject within their community. Statements were made: “I like doing this type of homework.” “Why are we doing this type of homework.” “I like that I got to choose how I did my homework. I like using the computer.” “My mom and I made a cool poster for the assignment.” “Can I work with a friend next time?” The drop in the student scores could be from the school having parent/teacher conferences, and we were pressed for time to get science instruction. It could also be that I asked more of the students, and the homework for the week took longer than thirty minutes.

CHAPTER FIVE

CLAIM, EVIDENCE REASONING

Claims From the Study

From this study, I can make the following claims:

1. Those students who did their science homework, there was a slight improvement in their assessment scores.
2. Students' attitudes towards homework were split, but students see the benefits of homework.
3. Parents see a benefit to homework, yet their views on homework differ from those of their students.

Impact on Assessment Scores

Before the IRB process, homework was not assigned in my science classroom. Student scores were low. Sixty percent of students had a D or lower. Scores were kept and contrasted with the results of this study to determine if an improvement was made after homework assignments were given. The result of this study showed that of those students who did their homework, 67% increased their science assessment scores by an average of 10%. Of the students who did not do their homework, 50% improved their science scores by 5 %, and 50% did not improve their science scores. The data for the students who did their homework showed that the science homework reiterated what they learned in class. This correlation suggests that homework helps students remember what they are learning about in the classroom.

Students' Attitude Towards Homework

Forty-six percent of the sixth-grade students surveyed had a positive attitude toward all homework and completed their science homework as assigned. Another forty-six percent of the sixth-grade students surveyed had a negative attitude toward homework. Of this group, 60-80% did the assigned homework over the five-week study. Those who didn't do their homework (20-40%) reported not doing it because they didn’t understand it, lacked motivation, attended a sporting event, or felt that homework was unimportant. Two percent refused to report why they did not do their homework. Forty-four percent of this group showed a two percent increase in assessment scores.

Eight percent of the students in this study had a neutral opinion on doing any homework in general. Of this group, 50% did not complete the science homework assignments, and 4% did not pass the Weekly Science assessments. This small group of students was on an IEP, even though modifications were implemented.

All students in all groups reported that homework should be optional. Eighty-seven percent of students in all three groups reported that homework was beneficial if it was in accordance with the subject covered in class. Seventy-seven percent of all the students reported being attentive when doing their science homework. Sixty-two percent of the students reported that teacher correction on homework assignments benefited learning.

Parent Attitude Towards Homework

Sixty-seven percent of parents surveyed had a positive attitude toward homework. Ninety-six percent of said parents reported that homework should be based on what the student’s study in their science classroom. Ninety-two percent reported that teacher homework correction significantly contributes to the student’s learning. Eighty-eight percent of these parents reported that homework given in a science class as an exercise reiterates what is taught in the classroom and helps students understand and comprehend the course subjects. Sixty-seven percent of this parent population viewed homework as necessary for students’ success in school. Forty-two percent of parents reported they believed homework should not be optional. Yet, 46% of the parents reported that homework grades should not affect the student’s final grade.

Value of the Study and Consideration for Future Research

The value of this study is that students who value homework and have a positive attitude toward it will do well on their assessments.

Variables to consider for future research include the following: Many of my students struggled with higher-order thinking questions. This would need to be taken into consideration if this study is replicated. The vocabulary of the assessment questions needs to be taught before the assessment is given. When analyzing the data, students needed help answering questions that had open-ended questions.

Some of my English Language Learners struggled with completing the assignments and assessments. In the future, I would front-load vocabulary, translate as needed, and let them use notes. An extension of the current subject being taught in the science classroom could be used as part of their English Language Development Class. Books and reading passages can help with the development of their academic vocabulary.

My Special Education Students struggled the most. In the future, I would provide a word bank or vocabulary bank for the open-ended questions. Even though their homework and assessments were modified, I would consider making a modified assessment specifically for those students. They could still use their notes, take the assessment in a separate classroom, and seek help when needed.

A future consideration would be starting the study at the beginning of the year to allow more time to gather data and change dependent variables as needed. In my science classroom, my homework expectations were not clear at the beginning of the school year. At the beginning of the year, I would make homework expectations clear to students and parents. This could help an educator improve student study and homework skills to make students even more successful at home.

Although I gave the evaluations on paper and pencil, and there was a slight improvement, analyzing assessments on the computer would have aligned with state testing, which is computerized. Students are not allowed to do state testing with pencil and paper.

I would revise the Student Pre-Survey because I felt the students did not understand what I asked them. I would review the Student Post-Survey out loud with my students before they took the survey so they understood the questions. I would make yes/no questions instead of a five-point scale. The five-point scale seemed too abstract for their thinking, and many students marked neutral for most of the questions on each Student Post-Survey that were given weekly. I would keep three open-ended questions. The last question I would change from “If they learned” to “What they learned” and have them write out something they learned.

Impact of Action Research on the Author

As an educator, this helped me learn which students had positive attitudes toward homework and which ones had negative attitudes toward homework. I realized why my students had a negative attitude. With this knowledge, I can create more meaningful and engaging homework for my students. I can also support those students who have a negative attitude by giving them after-school help or giving them time in class to work on homework.

When assigning homework, I must focus on what we learn in class. Homework isn’t about the quantity but the quality of the assignment. After the first two weeks, I realized that reading passages and answering questions were not beneficial for student engagement. The students were bored.

Homework must be thought out and not just handed to students as busy work or punishment. Incorporating hands-on or real-world experiences where students can engage in the world around them allows them to enjoy and understand the science concepts they are to learn. All homework combined should be kept under thirty minutes for 6th-grade students. Long, lengthy homework is time-consuming for the student and their families. Some students did not do their homework for this very reason.

If I were to change the homework, it would be small project-based science homework, a small research project, or a visual observation. I want to implement more Language Arts, Math, and History into my science homework so the student can complete all homework assignments in thirty minutes.

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APPENDICES

APPENDIX A

IRB APPROVAL

The IRB reviewed your protocol and has been approved.  
  
PI: Wear, Nancy  
Approval Date: 2/2/2024  
Title: THE EFFECT OF HOMEWORK ON SCIENCE TESTING  
  
Protocol #: 2024-1171-EXEMPT  
Review Type: Exemption  
Expiration Date: 2/2/2029

APPENDIX B

FAMILY SURVEY

Family Survey:

Parent Attitude Towards Homework:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | Strongly Agree | Agree | Uncertain | Disagree | Strongly Disagree |
| 1. My student has great fun while doing homework given in the science classes. |  |  |  |  |  |
| 1. Homework in science classes plays a significant role in helping my students understand the science course subjects. |  |  |  |  |  |
| 1. Homework given in the science classes should be optional. |  |  |  |  |  |
| 1. Teacher correcting homework given in science classes significantly contributes to correcting mistakes. |  |  |  |  |  |
| 1. The correction of homework given in science classes promotes the communication between teacher and student. |  |  |  |  |  |
| 1. It would be more beneficial if the course subject gave homework in science classes. |  |  |  |  |  |
| 1. My student tries to be attentive to the science class homework. |  |  |  |  |  |
| 1. Among homework given at school, my student receives homework in their science class |  |  |  |  |  |
| 1. Tests given as homework in the science class help students prepare for exams. |  |  |  |  |  |
| 1. It is more appealing if homework given in the science class is to be done in the classroom |  |  |  |  |  |
| 1. My student enjoys researching information for their science homework. |  |  |  |  |  |
| 1. I believe that homework in science classes improves my student’s imagination. |  |  |  |  |  |
| 1. My students would acquire more consistent knowledge if their science homework were group work. |  |  |  |  |  |
| 1. Homework given in science classes as preparatory work makes students more willing to learn the course subject. |  |  |  |  |  |
| 1. Homework given in science classes as an exercise enables students to understand and comprehend the course subject better. |  |  |  |  |  |
| 1. Homework and projects given in science classes do not improve my students' creativity. |  |  |  |  |  |
| 1. If the homework given in science class is related to current issues, my student is more willing to do it. |  |  |  |  |  |
| 1. the homework assessment in science classes should affect the teacher's final grade. |  |  |  |  |  |

APPENDIX C

ROOM 9 STUDENT SURVEY

Room 9 Survey

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | Strongly Agree | Agree | Uncertain | Disagree | Strongly Disagree |
| 1. I have great fun while doing my homework given in my science classes. |  |  |  |  |  |
| 1. The homework in my science classes helps me understand the subject of the science course. |  |  |  |  |  |
| 1. Homework given in my science class should be optional. |  |  |  |  |  |
| 1. Teacher feedback on homework that is given in science classes can make a difference in my learning |  |  |  |  |  |
| 1. Correcting homework given in my science class helps me communicate effectively with teachers and students. |  |  |  |  |  |
| 1. It would be helpful if the homework given in the science classes was related to the subject covered in class. |  |  |  |  |  |
| 1. I try to pay attention while doing homework given in my science classes. |  |  |  |  |  |
| 1. I am more willing to do my science homework when it is related to other subjects. |  |  |  |  |  |
| 1. Out of all the homework given at school, I do the homework given in my science classes. |  |  |  |  |  |
| 1. I am more willing to do my homework in my science classes when the homework is based on research. |  |  |  |  |  |
| 1. I will do my homework if my science homework correlates to my test. |  |  |  |  |  |
| 1. I like doing science homework when I can use multimedia, such as TV, the Internet, videos, etc. |  |  |  |  |  |
| 1. Homework in science classes improves my imagination. |  |  |  |  |  |
| 1. I would gain more knowledge if my science homework were given as group work. |  |  |  |  |  |
| 1. Homework given in science class on a subject we are about to learn makes us more willing to learn the course subject. |  |  |  |  |  |
| 1. Homework given in the science class as an exercise helps understand and comprehend the subject better. |  |  |  |  |  |
| 1. If homework given in science class is related to current issues, I am more willing to do homework. |  |  |  |  |  |
| 1. The grading of homework given in the science class can affect my final grade. |  |  |  |  |  |

APPENDIX D

STUDENT POST ASSESSMENT STUDENT SURVEY

Student Post-assessment survey:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | Strongly Agree | Agree | Neutral | Disagree | Strongly Disagree |
| 1. The science homework given to me took me less than 30 minutes to do. |  |  |  |  |  |
| 1. I was able to learn something from the science homework. |  |  |  |  |  |
| 1. I could do the science homework with little to no help from others. |  |  |  |  |  |
| 1. The science homework helped me towards what we were learning in class. |  |  |  |  |  |
| 1. The science homework helped me during my class instruction. |  |  |  |  |  |
| 1. The science homework was beneficial for my test. |  |  |  |  |  |
| 1. The science homework is helpful in what we are about to learn |  |  |  |  |  |

8: Briefly describe what you liked about the homework this past week:

9: Briefly describe what you did not like about the homework this past week:

10. What concerns/questions did you have about the homework this past week?