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The Effects of Homework Time and Related Factors on Academic Achievement

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THE EFFECTS OF HOMEWORK TIME AND RELATED FACTORS ON ACADEMIC ACHIEVEMENT

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Abstract

This paper explores the relationship between homework and academic achievement in the areas of homework time, parental involvement and home support, and teacher ideation and student conceptualization. The findings of 30 academic articles were analyzed and compiled into literature reviews. All relevant findings were categorized based upon their association to three areas. One, time spent on homework was positively correlated with student academic achievement. Two, parental involvement in a supportive home environment had significant impacts on achievement and homework completion. Three, homework should provide opportunities for student autonomy with a focus on student accuracy which allows teachers to identify areas of additional support.

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CHAPTER I: INTRODUCTION

"Are we going to have any homework today?" This is perhaps the most common question I am asked as a teacher. From the moment students enter the classroom, they are already thinking about what work they may have to complete after school. While the practice of assigning homework is commonplace in our current educational climate, it has continued to be a topic of discussion for teachers and administrators alike over the years (Murillo, 2014). An overview of the changing views about homework from the last century in the United States was offered by Maltese et al. (2012) who explained that the greatest shifts in homework focus parallel monumental world events such as the launching of Sputnik or the Vietnam War. In the year 2021, we find ourselves in the midst of another monumental world event as we navigate the COVID-19 pandemic. So, it should come as no surprise that the topic of homework is once again a focal point of education.

I am currently a seventh-grade life science teacher at two middle schools in Independent School District 196 in Minnesota. I spend my three morning classes at Dakota Hills Middle School in Eagan and my two afternoon classes at Falcon Ridge Middle School in Apple Valley. Over the past three years, I have graduated from college, worked in the corporate world until making the decision to go back to school, and obtained my teaching license. This was an unexpected change, as I never imagined myself as a school teacher. However, from the time I started spending time in classrooms and then moved into student teaching, I experienced numerous rewarding moments that affirmed the classroom was where I was supposed to be. Throughout this process of taking graduate classes, shadowing, and completing student

teaching, one issue has continued to be at the forefront of my mind as I thought of myself as an educator, “How will I handle homework in my classroom?”

The goal of this literature review is to provide a deeper understanding of the role homework plays in student achievement and identify best practices to apply as a classroom teacher. Most notably, 1) Is homework essential to the learning process? 2) How often should homework be assigned? 3) How is the length of time spent on homework related to the academic achievement of students? 4) What method of homework is the most beneficial to students?

Chapter I reveals the purpose of this review, defines the key terms prevalent in this research, and highlights the statement for the thesis. Chapter II is a literature review; it provides an overview of topics including: homework time and academic achievement, homework and home support, and teacher ideation and student conceptualization. Chapter III includes an analysis of the findings of the review, applications for classrooms today, and areas to be explored in future research.

Rationale

I have been a teacher for almost a full year and it seems as if the topic of homework is still just as important as it was when I was a student. In the schools in which I work, conversations around homework have been amplified by the current educational climate as distance and hybrid learning have become the new normal. I have seen the progression of education shift from teaching in person full-time with robust lessons and homework assignments to meeting on zoom with all of my students only twice a week while trimming lessons down to the bare minimum so that students aren’t overwhelmed. These changes were

deemed necessary as we were all in uncharted territory with this new challenge we faced as educators. Perhaps the most common thread throughout this tumultuous time has been figuring out the appropriate workload to put on our students. Some of my fellow teachers think it is important for students to have assignments to turn in each day in order to ensure they are learning the content while others only have students complete classwork with no point values so that students don't become overwhelmed with due dates or failing grades (Davidovitch & Yavich, 2017).

It seems as if each week we have meetings in which we are told students are overwhelmed and in need of a lighter workload; then teachers are left alone to adjust their lessons while also trying to keep up with student learning standards. As my colleagues and I plan our lessons, we seem to navigate the same questions: 1) Can we trust students to complete this work if there are no points assigned to it? 2) Should students be given a majority of class time to start (and hopefully finish) their homework to lighten the load once they are home? 3) Should I assign homework in addition to lesson content as we can't fit all of the requirements into a class day?

Perhaps one of the most important questions to come from these discussions has been, "Is this assignment worth the homework time for students to complete?" This is in light of the many assignments we determined were simply additional practice which forced us to wrestle with their necessity for most students. We also have ongoing discussions about the ideal assignment format; that is, which will offer our students the greatest success (e.g., check for understanding questions, online simulations, projects, worksheets)?

As a student who grew up in the public school system, I have experienced homework expectations that were all across the board. Some teachers assigned homework every day, while others expected unfinished classwork to be completed at home. While I was never fond of spending time outside of school completing homework, I had a general belief that homework was good for me as a student. I trusted that my teachers would only assign homework if they knew it would help me progress further in my education. This doesn't mean that I always loved homework; in fact, I usually had negative feelings toward homework as it took my free time away when I was out of school. You see, I was a student who was very invested in extracurricular activities and combining that time with homework made for a busy schedule. Nevertheless, I continued to make sure I completed my homework because I knew I should try to get good grades and keep up with my work, so I didn't fall behind.

Looking back on my experiences with homework as a student, I knew that I needed to have a clear rationale for my decision to assign homework or not. If my students ask me why they are completing an assignment for homework, I want to be able to give them a reason that isn't just "because I said so." I want to be able to develop the same level of trust with my students that I enjoyed with my teachers during my school years.

While teachers are those attempting to identify the optimal use of homework for their respective students, there are others in the local communities, the state, and the nation as a whole who are invested in the achievement of our students (Moroni et al., 2015). Parents, teachers, corporations, and government leaders want to be sure that the students in their communities are prepared and meet educational standards (Sirvani, 2007). In Minnesota, the greatest emphasis for identifying student achievement is put on the Minnesota Comprehensive

Assessments (MCAs). These tests assist Minnesota school districts in the measurement of student progress toward academic standards in math, reading, and science. While these tests do not provide information about the effectiveness of homework in relation to student achievement, one finding stated that students or schools that are falling behind are in need of additional homework (Fernández-Alonso & Suárez-Álvarez, 2015). Over the past few years, the outcomes of the MCAs have been especially important as the state of Minensota has had an ever increasing achievement gap. However, this data only allows us to see the areas in which students are struggling and it remains up to teachers and other educational leaders to determine the best strategies to address these disparities.

Determining the link between test scores, achievement, and homework is not just a question for Minnesota, it is one that the United States has been trying to figure out for many years. As a country, we value excellence, which is often measured by comparing the test scores of our students to those from other countries. Recent trends from the National Assessment of Educational Progress (NAEP) have shown that the reading and science scores of students in the United States have not changed significantly since the 1970s. While it is important to note that they are not decreasing, it should cause us to wonder what more can be done to see an increase in our achievement as a nation and the role homework plays in it.

Definitions of Terms

For the purposes of this thesis project, the following terms are defined.

Homework

The general goals of homework are reinforcing classroom learning, practicing new content, and applying knowledge (Davidovitch & Yavich, 2017). In this thesis, homework refers

to any school-related assignments or studying that is completed outside of normal school hours. This means that the work is often completed without the supervision of a teacher and completed at the time and place a student chooses.

Achievement

Achievement is "students' overall academic performance without considering the influence of external factors such as gender, cultural and socioeconomic background, and students' mother tongue" (Murillo, 2014). This term will often be coupled with "academic" to identify the specific type of achievement being measured. In many of these studies, academic achievement is measured by marks received on a standardized test or final grades given at the end of a school term.

Statement of Research Question

The emphasis placed on student achievement is why I believe it is vital for educators to identify the factors that contribute most to student success. Also, the role of homework in the educational system has seen many changes as research has continued to identify its role in modern education. Therefore, the purpose of this thesis is to answer this research question: How does homework relate to the academic achievement of students?

CHAPTER II: LITERATURE REVIEW

The studies included in this review span across seven countries (i.e., China, Israel, Japan, South Korea, Spain, Switzerland, and the United States) as well as the region of Latin America with students enrolled in schools from elementary to college. All articles were found using the Bethel University Library website to access available databases. The databases used were as follows: Academic Search Premier, EBSCO MegaFILE, ERIC, and JSTOR. Twenty-five of the articles were found using Academic Search Premier. All keywords used in the search process were academic achievement, achievement, attitudes, cyber school, homework, middle school, out of school activities, parental involvement, parents, primary school, students, teachers, and time. The criteria for all of the articles was three-fold: peer reviewed, full-text availability, and academic journal inclusion.

The initial parameters of the search process were homework and achievement. At that point, homework included any form of work that teachers expected students to complete outside of school hours and achievement included any measure of student academic success. This was primarily found using student grade point average (GPA) or test scores. This yielded 230 results of articles relating to the relationship between homework time and academic achievement (Kalenkoski & Pabilonia, 2017). The search was later expanded to include articles centered around student attitudes toward homework and teacher motivation for assigning homework (Burris & Snead, 2017; Davidovitch & Yavich, 2017). Further searches included articles that focused on school type and parental involvement with homework. Some articles were excluded for reasons such as small sample sizes or unconnected themes to primary data points (homework or achievement). One such study conducted by Miller et al. (1993) was

excluded for its small sample size of 13 students as it related accuracy of self-corrected homework to achievement.

Narrowing Process

The initial search using the keywords homework and achievement yielded 690 results which needed to become more focused. I added additional limiting parameters to only include full text and academic journal articles which produced the first few pages of relevant articles to analyze. While this was still a fairly broad search group, 50 articles were found to be relevant for further literature review. Five of the articles from this first search had explicit connections between homework and achievement (Chen & Stevenson, 1989; Kalenkoski & Pabilonia, 2017; Maltese et al., 2012; Murillo & Martinez-Garrido, 2014; Won & Han, 2010). These articles created a foundation for future searches as they inspired new search criteria to explore.

As I continued to examine articles from this search, they eventually began to depart from my focus on homework and achievement. This caused me to adjust my search parameters again to see whether or not I could find other subsections of these keywords. The next grouping of articles that I examined centered around attitudes, homework, and achievement. This criteria produced 42 articles that focused on the attitudes of students and their parents in regard to homework (Burris & Snead, 2017; Chang et al., 2014; Davidovitch & Yavich, 2017; Dettmers et al., 2010; Fernández-Alonso & Suárez-Álvarez, 2015; Kitsantas et al., 2011). This search also curated articles which identified various forms of homework and they affected overall student academic achievement and homework completion (Galyon et al., 2017; Hwang et al., 2010; Rawson et al., 2017; Núñez et al., 2015; Radhakrishnan et al., 2009; Rosário et al., 2018; Simkin & Stiver, 2016; Van Voorhis, 2003; Wong, 2001). This batch of articles branched into further

searches focused on out-of-school activities that may influence the time students have for homework (Cooper et al., 1999; Martinez, 2011) and even led me to search for homework practices in various school settings such as cyber school, primary, middle, and high schools (Beck et al., 2017; Katz et al., 2010). The analysis of Cooper et al. (1999) also stemmed from the numerous citations in previous article reviews relating to previous studies conducted by them. A few of the articles that I found in these searches also included aspects of parental involvement in their data collection (Pomerantz et al., 2006; Sirvani, 2007; Trautwein et al., 2009; Trautwein et al., 2007) which then led me to search for direct research between homework, achievement, and parental involvement (Bilige & Gan, 2019; Moroni et al., 2015).

Article Selection

Once I had finalized the articles for inclusion in this literature review, I had to determine my primary research categories. First, I reread all of my literature reviews and made a list of the primary concepts that each of them touched on in their results. Next, I compiled this list in a document and marked each article that included that concept with an "X." Overall, 26 concepts were represented in the final list. Only five of the thirty articles did not explicitly connect their studies to homework time or achievement (Davidovitch & Yavich, 2017; Galyon et al., 2017; Katz et al., 2010; Pomerantz et al., 2006; Rosário et al., 2018). However, they were included in this review as they provided valuable connections with other data points that are referenced throughout other articles.

The concepts with the most connections between articles were achievement (22), homework effort/quality (11), homework time (18), parental involvement in school/homework (10), student feelings towards homework (15), and teacher homework motivation (11). While

the rest of the concepts were helpful in breaking down each article, they were ultimately left out of the final grouping as they did not exhibit the strongest connection to the overall focus of this review. These conceptual groups are what led me to create three article categories. Homework time and achievement were combined to create the first category. The second category focused on parental involvement in school/homework and homework effort/quality. The third category was made up of the remaining common concepts which were student feelings towards homework and teacher homework motivation. Initially, many of the articles fit into two or even all three of the categories which forced me to decide which articles should be drafted into each category. Therefore, I once again reread the literature reviews of those that fell into multiple categories. Ultimately, category one included 11 articles, category two included seven articles, and category three included 12 articles.

Chapter II is divided into three main sections: 1) Homework Time and Academic Achievement, 2) Homework and Home Support, and 3) Teacher Ideation and Student Conceptualization.

Homework Time and Academic Achievement

Kalenkoski and Pabilonia (2017) conducted a study using time-diary data to investigate whether homework given to high school students would increase academic achievement as previous studies had used retrospective questionnaires which may have been subject to inaccuracies and social desirability bias. The sample size included 817 students and was chosen based upon attending grades 9-12 and eventually high school graduates. Additional qualifying criteria were also used from the Child Development Supplement to the Panel Study of Income Dynamics (PSID-CDS) and its follow up, the Transition to Adulthood Survey (TA). Data gathered

from the PSID-CDS included the homework time from two time-diaries, one collected on a weekday and the other on a weekend day. The TA provided high school grade point average (GPA) and college attendance. Kalenkoski and Pabilonia (2017) used these two studies to analyze numerous data points and variables.

The measure of homework was broken down into four groups: total homework time (as either a primary or secondary activity), time spent doing homework as a primary activity (could still be combined with another activity but homework was the priority), time spent doing homework as a sole activity, and whether or not students did any homework on the two diary days. These measures were then used to estimate the effects of homework time on high school GPA and college attendance by age 20 (which were deemed long-term measures of academic achievement). The measure of academic achievement was a continuous measure for high school GPA (ranging from 0-100), while college attendance was equal to one if they did attend before age 20 and zero otherwise. Further control variables were included which may have represented unobserved factors to homework time and academic achievement including "gender, test scores, demographic and family backgrounds, school-level characteristics, region, and whether or not a state mandates a college-entrance exam for high school students" (p. 46). Time-diary data for the weekday was multiplied by five and the weekend day was multiplied by two in order to have a full week of data.

Statistical analysis of this data revealed several important findings. One, the average high school GPA was 81 out of 100; girls achieved slightly higher scores than boys (83 vs. 79). Girls also logged 7.6 hours of homework per week, whereas boys averaged 5.2 hours. The breakdown of the homework groups provided the most significant results as those in the top GPA quartile

averaged significantly more homework than those in the bottom GPA quartile in total homework ($p < .01$), homework as a primary activity ($p < .05$), homework as a sole activity ($p < .05$) and any homework ($p < .10$). As for college attendance, only boys showed significant differences in the areas of total homework ($p < .01$), homework as a primary activity ($p < .01$) and homework as a sole activity ($p < .05$).

Murillo and Martinez-Garrido (2014) conducted a study to describe teachers' habits regarding the setting and evaluation of homework in Math and Language and to determine the impact of homework on students' academic achievement. The population for this study included 95,053 students in third grade and 91,223 students in sixth grade. All relevant data was collected from the United Nations Educational, Scientific and Cultural Organisation's (UNESCO) Second Regional Comparative and Explanatory Study (SERCE) database, whose main objective was to describe the way Latin American students learn Math and Language. Student data represented 16 Latin American countries and 2,969 different schools.

The methods for this study included three primary groups of variables including variables related to homework (4), variables related to students' academic achievement (2), and control variables (7). Variables related to homework were obtained from questionnaires filled in by third and sixth-grade Math and Language teachers and included: "(1) Homework-setting frequency; (2) Estimated time required for completing homework; (3) Number of times the teacher checks the homework; and (4) Number of times the teacher builds on homework in class to teach new concepts" (pp. 666-667). Variables related to students' academic achievement were obtained from a standard test approved by all countries in the database and included: "(1) Performance in Maths; and (2) Reading proficiency" (pp. 666-667). Control

variables were gathered from questionnaires filled out by students, their families and school managers and included: (1) Socioeconomic level of each student's family, (2) Cultural level of the family, (3) Gender, (4) Student's mother tongue, (5) Number of years the student spent in pre-primary education; (6) Socioeconomic background of the school's catchment area: and (7) Human Development Index. Achievement was defined as the overall academic performance of students without consideration of the influence of external factors such as gender, cultural, socioeconomic background, and student' mother tongue.

Descriptive analysis focused on the ways in which teachers utilized homework and concluded that between 45-50% of teachers assign homework in most classes, while 35-38% assign it in all classes. In regard to homework completion time, "59.6% (Grade 3) and 46.4% (Grade 6) of Math teachers and 61.1% and 56.0% of Language teachers (Grades 3 and 6, respectively) believed that it would take 15–30 minutes" (p. 670). According to the survey, over 80% of the Math and Language teachers corrected homework in more than 80% of their classes. The analysis of the frequency of building on homework in classroom teaching found that 33% of teachers did this in all of their classes, while another 33% did this in more than 70% of classes. Multilevel models with four levels of analysis were used to identify the significance of the four analyzed variables: frequency of setting homework, expected time requirement for completing the homework, grading of the homework, and building on the homework in class. There was a significant difference in academic achievement of sixth-grade language students and whether or not the teacher corrected homework. Significant differences were also found in the academic achievement of third grade language students and sixth-grade math and language students in regard to the teacher building on their homework in class.

A study conducted by Won and Han (2010) focused on students' out-of-school activities and achievement while collecting nationally representative data to compare between the United States and South Korea. Data was collected from the 2003 Trends in International Mathematics and Science Study (TIMSS) and included 8,912 American and 5,309 Korean Grade 8 students. TIMSS was used to assess science and mathematical achievement and included further information about teaching and learning contexts, school life, and background information from principals, teachers, and students. Won and Han (2010) sought to use this data and expand on previous research to conduct their study with higher levels of accuracy. They controlled for "potential influencing factors such as the economic or home resources of the family and parent education level, "as well as student age as "age is one of the stronger determinants of involvement in certain activities" (p. 638) to provide more comparable results between out-of-school activities and achievement.

Many variables were accounted for in the areas of students' out-of-school activities, home resources, parent education level, and achievement. Students were asked how much time they spend out of school on nine activities: "watch television and videos, play computer games, play or talk with friends, do jobs at home, work at a paid job, play sports, read a book for enjoyment, use the internet and do homework" (p. 640). These were the most common self-managed activities among adolescents and students graded the time spent on them from zero to five. Home resources referred to the total number of books in the student's home excluding magazines, newspapers, and school books. Parent education level was determined according to the highest level of education of either parent. Finally, achievement was calculated as "the mean of five plausible mathematics test scores provided in the TIMSS data" (p. 641).

In regard to homework, Won and Han (2010) made many significant discoveries in the data analysis. The first was that female students spent more hours doing homework than did male students in the United States (U.S.) ($p < .001$). While comparing high achievers to low achievers in Korea, the high achievers spent more hours doing homework than low achievers ($p < .001$). However, the U.S. data showed no statistical significance between high and low achievers and time spent on homework. In the U.S. data, significance was found in the relationship between achievement and homework as higher achievers had a positive association with effect size (.13) and low achievers had a negative association with effect size (-.24). Won and Han (2010) concluded that "time devotion to homework is positively associated with achievement in Korea, but it is negatively associated with achievement in the U.S." (p. 653), meaning the amount of time is not necessarily related to successful outcomes for U.S. students.

A study conducted by Maltese et al. (2012) utilized data from the National Education Longitudinal Study of 1990 (NELS) and the Education Longitudinal Study of 2002 (ELS) in order to determine the effects of homework completion on the academic achievement of high school students. The data selected from the NELS and ELS was for students in a single 10th-grade math or science class who participated in both rounds of the studies and had valid high school transcripts. The NELS data included a total of 10,910 (51% girls, 49% boys) students in the science sample, 7,120 (53% girls, 47% boys) students in the math sample, and 7,810 (52% girls, 47% boys) students in the ELS math datas. With these two studies, Matlese et al. (2012) gathered many more variables in order to have a comprehensive understanding of the ways in which homework may affect student achievement.

The measure of achievement was indicated by standardized exam scores and final course grades in the associated high school classes which were gathered from students' secondary transcript records. The transcripts made it possible for Maltese et al. (2012) to "determine the length and level of classes, the amount of credits attempted, and final grades" (p. 58). Homework was defined as, "work assigned by teachers and intended for completion outside of class time," and students reported this as the, "average number of hours per week spent in school and out of school on completion of science and math homework" (p. 58). Demographic variables were included in this study to account for any relationships between achievement and gender, race, and parent's highest educational level. Maltese et al. (2012) also incorporated variables to control for, "differences in achievement (i.e., standardized test scores or grades), motivation and work ethic and the academic level (i.e., basic, general, or advanced) of courses enrolled" (p. 59). The type of school, public or private, was also accounted for in this study. Other variables that were associated with how students spent their time outside of school, such as work or watching television, were initially included in the study but were later dropped from the final models due to a lack of significance. Maltese et al. (2012) used a multiple linear regression to analyze the data as "it allows for the exploration of associations between a continuous outcome variable and multiple independent variables" (p. 58).

Maltese et al. (2012) found that the average daily time students spent on homework from the NELS was 33 minutes for science, 37 minutes for math, and 60 minutes for ELS. The first group of data compared was time spent on homework and average student grades. In all three groups, "grades among students who reported either very low levels or very high levels of time on homework have lower course grade averages and the same can be said for test scores"

(p. 61). This means students who reported between 30 and 120 minutes of homework had the highest average grades and test scores. Maltese et al. (2012) was unable to find a consistent significant relationship between time spent on homework and final grades; there was also no significance between students who completed no homework and those who did.

Nearly all associations between the two variables were significant and positive. Furthermore, students who spent between 1-60 and 61-120 minutes each day on homework scored 1.8-2.2 and 2.9-3.0 points higher, respectively, on standardized tests than students who did no homework. Maltese et al. (2012) applied these findings to college admissions tests as "the standardized mathematics test used in both NELS and ELS (prepared by Educational Testing Service (ETS)) have similar components to the Standardized Achievement Test (SAT) administered by the College Board (also prepared by ETS)" (p. 61). This analysis included a smaller sample size as not all students completed the SAT. However, the students who completed 31-90 minutes of homework each day scored about 40 points higher on the SAT than students who completed no homework. Also, students who spent more than 120 minutes on daily homework scored similarly to students who only completed 30 minutes each day.

Beck et al. (2017) surveyed students and parents in order to determine the relationship between cyber schools, homework, and achievement. Participants from this study were all selected from one American cyber school, Sun Tech, and were sent an email to ask for their participation. The school consisted of 750 students from grades eight through 12 and the students included in the study had to have been at the school for at least one year. The final number of participants to respond to the survey between September 2011 and December 2011 included 269 students and 232 parents. Beck et al. (2017) also noted that "only 15.1% of Sun

Tech parents identified themselves as college graduates," and that "the median Sun Tech student enters the school reading approximately 4 years below grade level" (p. 25).

The survey included 66 items and was meant to assess three scales: "reasons for choosing this school, involvement, and satisfaction" (p. 25). Satisfaction was measured based on 14 items (peer relations, teacher-student relations, and teacher expectations) as was scored from 1 (very dissatisfied) to 5 (very satisfied). Student GPA and standardized test scores were provided by Sun Tech and nights of homework per week was measured by student self-reports.

All of this data was then analyzed with various models including ANOVA, ordered logistic regression methods, and descriptive statistics. One of the findings from the descriptive statistics demonstrated that parents graded the school more positively as reported homework nights increased. There was also a small significant correlation between the grade that students gave the school and the number of nights that the students had homework. In regard to achievement, it was significant that the GPA for the fall semester increased as student-reported homework increased ($p < .01$). The parent-reported homework data also showed a significant positive correlation between increasing homework and fall GPA ($p < .1$) as well as an even stronger correlation for spring GPA ($p < .01$). In contrast, there was also a, "modest positive relationship between student-reported homework and retention in grade ($p < .01$)" (p. 25).

The next two findings focused on the role of the family in relation to student homework and achievement. The first found that students of single mothers reported significantly less homework than other students ($p < .01$). The second demonstrated a strong significant correlation between, "students-reported assistance on homework from the father on both fall GPA ($p < .01$) and spring GPA ($p < .05$)" (p. 25). Finally, an ANOVA was conducted in order to

determine relationships between the grades students and parents gave to the school in relation to the nights of homework they each reported. After analysis, the ideal number of homework nights that had the highest combined school grade was 3.79 nights per week.

Fernández-Alonso and Suárez-Álvarez (2015) studied the effects of homework on the academic achievement of students in science and mathematics. The study was conducted in a northern region of Spain and included 7,725 students, with a mean age of 13.78, from 353 classes and 148 schools. The student-level questions examined "time spent on homework, effort made, and how it was done, while the class level evaluated the frequency and quantity of homework set" (p. 1076). These variables were also combined with four background variables including socioeconomic and cultural level, gender, school grades, and repetition of school year.

Data was collected from students as each completed a homework evaluation questionnaire and a test comprised of 24 questions for both math and science. Two multiple-choice questions from the questionnaire were used to evaluate the total daily time dedicated to homework. One asked about the frequency at which homework was completed and the other asked for the total daily time spent on homework for all subjects. The effort that students put forth on homework was measured on a four-point scale (1 = never; 4 = always) according to student responses to these three statements: "(*I make an effort to get good marks, I finish my homework even if they are difficult or they take me a long time, and I am careful to keep my notebooks and work neat and tidy)"* (p. 1077). Another question asked students how much help they needed to complete their homework assignments with answers ranging from "no help needed' to "always needing help." Student homework behavior was analyzed using Pearson correlations and descriptive statistics while a multilevel analysis was used to determine

the effect of homework on academic achievement. When analyzing data specific to students who did complete their homework, Fernández-Alonso and Suárez-Álvarez (2015) removed students who never did their homework. This resulted in analyzing data obtained from 7,421 students, a reduction of 2.4%.

The analysis of homework frequency determined that students spend between one and two hours on daily homework with teachers assigning a little over 70 minutes of daily homework. Fernández-Alonso and Suárez-Álvarez (2015) determined that "there is an optimal amount of, and time to spend on, homework and once that threshold is passed, the time spent and the amount of homework stop being effective and end up being detrimental" (p. 1080). In science, the optimal amount of homework time was between 90 and 100 minutes. However, the most efficient amount of homework was determined to be 70 minutes as the increase of homework time resulted in a small gain for an additional two hours of homework each week. The analysis of mathematics came to a similar conclusion; one hour was determined to be the time to achieve satisfactory results.

Fernández-Alonso and Suárez-Álvarez (2015) then analyzed the variables of student effort and autonomy and found that they were both "more important than the time spent, the frequency or the amount of homework" (p. 1080). In regard to the amount of help students receive with their homework, autonomous students were able to spend less time on homework and achieve much higher scores than students who needed additional help. Fernández-Alonso and Suárez-Álvarez (2015) found "a dependent student who spends 70 minutes a day on homework would expect results in the 50th percentile whereas an autonomous student who spends the same amount of time would expect to score in the 70th percentile" (p. 1081).

Another variable that had a large impact on testing was the frequency of homework assigned by the teachers. Students in classes where the teacher assigned homework each day were predicted to score 15% of the standard deviation (SD) higher on the test than classes with homework being assigned less frequently. Also, the addition of students completing their homework autonomously, combined with the daily homework, increased the predicted score by 27% of the SD.

Kitsantas et al. (2011) conducted a study to analyze the relationships between mathematics self-efficacy beliefs, homework support resources, time spent on math homework, and mathematics achievement. A secondary focus examined how race and gender may play a role in these relationships. Kitsantas et al. (2011) gathered data from the 2003 Program for International Student Assessment (PISA) which was administered by the National Center for Educational Statistics (NCES). This assessment provided information about the reading, math, and science literacy of 15-year-olds in the United States. The final sample size for this study included 5,200 students (2,603 boys and 2,597 girls) with an ethnic breakdown of "3,097 Caucasian, 799 African American, 883 Hispanic, 169 Asian, and 252 of mixed or other ethnicity" (p. 316).

The first measure of the study, mathematics achievement, was determined by "85 test items and was reported on a continuous scale as a set of five plausible values for each student" (p.317). Mathematics self-efficacy was measured by student responses to eight questions that gauged their confidence in performing various mathematical calculations. The time students spent on math homework was defined as the ratio of self-reported time spent only on math homework to the total time spent on all homework. Kitsantas et al. (2011) measured homework

support resources by student responses to eight questions regarding their access to the following homework resources: “a desk to study at, a room of their own for the student, a quiet place to study, a computer for use with school work, a link to the internet, their own calculator, books to help with their homework, and dictionaries” (p. 318).

Kitsantas et al. (2011) utilized descriptive statistics to determine that students spent about a fifth of their total homework time on math homework. Significant correlations were discovered between math self-efficacy and mathematics achievement ($p < .001$) while homework support resources had a positive correlation with both of these variables ($p < .001$). However, there was a significantly negative association between homework support resources and time spent on math homework ($p < .001$). There was also a slight significance between time spent on homework and math self-efficacy ($p < .001$). There were also significant differences between males and females’ time spent on math homework as females spent about 5% more than males. Also, as it pertains to race, Black and Hispanic students spent about 21% and 16% more time respectively on homework than their White counterparts ($p < .001$).

The analysis of homework support resources determined a significant mean difference between genders as females had a 2.4% higher mean homework support than males ($p < .001$). The breakdown of race also unveiled significant differences as “White students had 10% more homework support resources than Black students, 13% more homework support than Hispanic students, and 4% more homework support than students who identified themselves as belonging to multiple/other races” (p. 323). The mean mathematics achievement for males exceeded that of the females ($p < .001$), and the mean mathematics achievement of white

students was significantly higher than black, hispanic, and multiple/other race students ($p < .001$).

Rawson et al. (2017) took a new approach to analyzing student homework activity by replacing self-reported homework data with smartpens that could collect timestamps of every stroke a student used to complete their homework. All of this data was collected to determine the relationships between homework and achievement based upon variables relating to how much homework was completed and when it was completed. The smartpens gathered real-time data as students completed their homework and provided the most accurate results relating to how much time was spent completing homework. The timestamped data also allowed Rawson et al. (2017) to identify the time of the day students completed homework at as well as the amount of strokes students used in order to determine the quality of the time spent on homework.

The participants for this study were selected based upon their enrollment in an entry-level engineering course at the University of California, Riverside. Over a period of three years, 328 students were involved in the study (92 in 2010, 109 in 2011, and 127 in 2012). Students began using the smartpens to complete all homework assignments, quizzes, and exams at the beginning of the third week of school. Rawson et al. (2017) analyzed data from seven homework assignments from 2010-2011 and six from the 2012 group. The final data also included smartpen logs from “five quizzes, two midterm exams, and one comprehensive final” (p. 212). At the end of each year, students answered a survey that gathered information about demographics, instructional technology used, study habits, and course perceptions.

Rawson et al. (2017) focused on 13 quantitative measures that summarized students' homework activity. The list of measures included: "total homework time, due date ink fraction, late night ink fraction, number of homework sessions, equation, diagram, and cross-out strokes, total ink length, problems attempted, average time per problem, average pen speed, and [number of questions completed] out of order" (p. 213). Total homework time included any time spent using the smartpen while excluding any period of inactivity longer than ten minutes. Due date ink fraction was defined as the "fraction of pen strokes written within 24 hours of the due date," while late night ink fraction is the "pen strokes written between midnight and 4 a.m." (p. 213).

Rawson et al. (2017) found a significant and positive correlation between total homework time and course grades ($p < .05$). Due date ink fraction was also significant, but it had a negative correlation for all students ($P < .05$). However, there was no significance between course grades and late night ink fraction. The number of homework sessions had a significant relationship with course grades for all students. Homework quality analysis found that the total strokes had a significant and positive correlation to course grades for all students, including results for equation, diagram, and cross-out strokes. Average time per problem and problems attempted, both in relation to course grades, represented the final positive and significant correlations.

Chen and Stevenson (1989) studied students from three different countries in order to examine the cultural differences between them in regard to time spent on homework and beliefs and attitudes about homework. The cities chosen for this study included two from the United States, Chicago and Minneapolis, two from China, Beijing and Taipei, and one from

Japan, Sendai. Chen and Stevenson (1989) conducted four studies between 1980 and 1986. Students were selected from at least 10 schools in each city. Target samples of six to 12 students were randomly selected from two classrooms in each school for a total of 3,937 students over four years. Chen and Stevenson (1989) tested students' academic achievement and interviewed the students, their mothers, and their teachers.

Students took a reading and a math test in order to demonstrate their academic achievement. The reading tests were, "constructed by teams of researchers from each culture" and "strong efforts were made to ensure that the content of the items was culturally fair and appropriate" (p. 553). The tests did change slightly between studies, but the core concepts that were measured stayed consistent. The math tests used in study one and two contained 70 items covering computation and the application of mathematics principles, while studies three and four had 79 items. Students began the test with lower grade level math questions and continued until they failed four consecutive questions. While conducting the interviews, Chen and Stevenson (1989) made a strong effort to ensure linguistic comparability and cultural appropriateness of the items. Interviews with parents were about one hour in length and focused on the child's development and parental beliefs. Teacher interviews centered around teaching practices and philosophy, while the student interviews were shorter and focused on their experiences and attitudes towards school.

Students in Chicago and Minneapolis both had significantly different scores on the reading and math tests compared to Sendai, and Taipei with Beijing only being significantly different than Chicago ($p < .001$). However, there were no significant differences among the three Asian cities. Chen and Stevenson's (1989) analysis of time on homework discovered that

Minneapolis first graders completed one-third of the homework of Sendai first graders, and one seventh of students in Taipei. Based upon teacher estimates of the amount of homework assignments given to students, “First graders in Taipei were assigned more than twice as much homework as first graders in Sendai, and more than 10 times the amount assigned in Minneapolis” (p. 556). The analysis of the fifth-grade teachers also revealed that, “China assigned twice as much homework as Japanese teachers and four times as much as American teachers” (p. 556).

One of the primary cultural differences explored in this study was the relationship between homework time and achievement within cultures. Chen and Stevenson (1989) found “no consistent linear or curvilinear relation between the amount of time spent on homework and the child’s level of academic achievement” (p. 556). Further analysis of this relationship was conducted with data from Minneapolis and Taipei as Chen and Stevenson (1989) had data for those students from first and fifth grade. Minneapolis did record a significant relationship between time on homework and achievement between scores for grades 1 and 5 ($p < .001$).

An analysis of the students’ attitudes toward homework revealed that student’s who liked homework had a positive relationship with liking school. When Chinese students were asked about their reasons for doing homework they said they completed it because they didn’t want to get in trouble with their teachers. However, these students did not present negative attitudes towards homework despite having to complete large amounts each day. Meanwhile, American and Japanese students put in the minimal amount of time into homework and had no indication of enjoyment. An analysis of how help with homework impacted achievement found that increased time with parents helping students with homework was negatively associated

with student achievement. Finally, the teachers were asked to rate the importance of homework on a nine-point scale, with one being very unimportant and nine being very important. American teachers rated the importance of homework as a 4.4 which was lower than both Taipei and Sendai teachers who rated it 7.3 and 5.8 respectively.

Chang et al. (2014) conducted a study to identify the relationships between time spent on homework and attitudes towards certain aspects of homework to Foreign Language achievement outcomes. The study included 2,342 students over the age of 18 who were enrolled in an intensive Foreign Language (FL) course during the 2010-2011 school year. Students were selected from 163 classes covering multiple FLs, with each class focusing on one FL. Researchers administered a survey before the class began to gather information about students' level of education, level of motivation for learning the given FL, and language learning aptitude.

Students also completed an anonymous survey at the end of the course to provide data about homework. The sum of the homework data was narrowed down into four groups: “relevance of assigned homework to course content, usefulness of feedback provided on assigned homework, fairness of the grading of assigned homework, and time spent on assigned homework” (p. 1053). The methods consisted of two models: model 1 compared student variables to group variables and model 2 combined the homework variables with model 1. The homework variables included homework relevance (HWRelevance), homework feedback (HWFeedback), homework grading (HWGrading), and homework time (HWTime). Outcome data was determined by a combination of GPA and proficiency tests including the “Defense Language

Proficiency Test (DLPT) and the Oral Proficiency Interview (OPI)" (p. 1053) which determined scores relating to listening, reading and speaking a FL.

The results were divided between descriptive statistics, correlations between homework variables and course outcomes, and regression models of course outcomes. The descriptive statistics determined that all class data could be used together as there was "no evidence of systematic differences between languages in attitudes toward homework or time spent on homework" (p. 1056). The analysis of correlations between homework variables and course outcomes found that all variables from both groups correlated significantly to each other. All of the homework variables were positively associated with outcomes while HWTime was "negatively correlated with outcomes both at relatively low levels of HWTime and at relatively high levels" (p. 1057).

Chang et al. (2014) determined that each homework variable was best analyzed at the student level in regards to the regression models of course outcomes. The analysis of student variables determined that aptitude, education, and motivation were positively associated with GPA while the analysis of homework variables determined that HWGrading and HWRelevance were positively related to GPA. Homework time was negatively related to GPA. Furthermore, the "post hoc comparisons of GPA distributions by level of HWTime revealed that a significant difference in GPA between students who reported spending some amount of time on assigned homework and those who reported spending no time on assigned homework emerged at values of HWTime of more than 1.5 hr/day" (p. 1058).

Cooper et al. (1999) conducted a study with three Tennessee school districts in order to explore the relationships between after-school activities and student achievement. The study

included 424 students from grades 6-12; the districts represented metropolitan, suburban, and rural areas. The students and one parent, 87% of which were the mother, completed questionnaires from which all data was gathered. The purpose of this was to compare the student and parent results to one another to determine reliability. There were six main questions on this questionnaire; the foci were the amount of homework assigned by the teacher each night; the amount of homework completed by the student; the number of hours per week the student worked at a job; the amount of hours per week students spent on extracurricular activities; the hours spent per week in groups outside of school; and the number of hours of television students watched on a school night. The question about how much homework teachers assigned was completed differently for students and parents as students answered this question based upon one class while parents answered it based upon all homework.

The researchers also gathered various student background characteristics (e.g., gender, ethnic background, and free-lunch eligibility). The questionnaire also asked how often an adult was home when the student came home from school. One of the measures for student achievement was the Tennessee Comprehensive Assessment Program (TCAP) which students in grades 2-8 and grade 10 complete. This data was combined with two other measures, "teacher-assigned grades and teacher-assigned grades controlling for TCAP scores," to determine student achievement (p. 373). Students, their teachers, and parents completed the questionnaires in the Spring of 1995 and grades and test scores were also gathered at that time.

An initial analysis of the agreement between student and parent responses determined that the responses for after-school activities and achievement were at acceptable levels of

consistency. Cooper et al. (1999) conducted simple correlations between after-school activities and achievement which reported that time on homework had a significant, positive correlation with teacher-assigned grades, and assigned grades after controlling for standardized test scores. However, time on homework had no significant relationship with achievement test scores, "although the data suggested that higher test scores were associated with more time spent on homework" (p. 374). Cooper et al. (1999) stated that this difference may have been attributed to the different questions asked of parents and students regarding the amount of time spent on homework. This caused Cooper et al. (1999) to analyze only the parent reports, which had a significant, positive correlation between homework time and achievement test scores. Time spent watching TV was negatively related to all measures of achievement. Meanwhile, participation in extracurricular activities was positively associated with all measures of achievement. Similar positive correlations were found for participation in other after-school groups with the exception of higher teacher-assigned grades after controlling for achievement scores. Time spent at a job was negatively related to all achievement measures.

An analysis of student background variables in regard to achievement found that students who are eligible for free lunch had lower achievement. The presence of an adult at home when the student returned from school had no association with any achievement measure. An analysis of ethnicity and time spent watching TV found that "the negative relationship between watching television and achievement test scores held for White students, but the trend for non-White students was in the opposite direction" (p. 376). Cooper et al. (1999) also examined curvilinear relationships by running multiple regressions. The results of these curvilinear relationships determined that "higher amounts of student time participating in

extracurricular activities were associated with higher achievement test scores. However, at the highest level of extracurricular participation, achievement test scores dropped dramatically" (p. 376).

Homework and Home Support

Van Voorhis (2003) sought to understand the most effective type of homework by conducting a study using a method of homework called Teachers Involve Parents in Schoolwork (TIPS) interactive homework. The participants included 253 students in sixth and eighth grade from low, average, and honors ability levels including 53% White, 36% African American, and 11% multiracial, Asian American, or other ethnic groups. The students were a part of 10 classes and the effectiveness of TIPS was analyzed. Six classes were assigned the TIPS homework and four were assigned the noninteractive homework over a period of 18 weeks. At the end of the study the students and parents completed a survey to aid in the analysis of the measured variables: homework completion, homework accuracy, attitude towards homework, overall achievement, and family involvement.

In order to conduct this experiment, Van Voorhis (2003) collaborated with the teachers of these classes to create the TIPS assignments so that they matched the science curriculum over the period of the study. The TIPS homework was given to each group, interactive and noninteractive, but the noninteractive group did not include "prompts or instructions for the student or family regarding involvement" (p. 327). The teachers assigned one of these assignments each week, graded them, and included "the same homework-related question on student examination for both conditions" (p. 328). The independent variables included prior science achievement, grade level, student race, student gender, mother's education level, and

student ability level. The dependent variables included family involvement, homework accuracy, time on homework, homework completion, science achievement, and science attitudes. Family involvement, time on homework, and opinions of the assignments were all gathered from questions on the survey given to parents and students. Science achievement measures were determined by student report cards and the percentage of homework-related test questions that were answered correctly.

Data analyzed included comparative results between the interactive and noninteractive groups according to five variables: family involvement, homework return rates, homework accuracy, science achievement, and attitudes towards the homework. In the first variable, over 80% of students in the noninteractive group stated that their families were, “never, rarely, or sometimes involved in their science homework,” while 80% of the TIPS students said that their families were “sometimes, frequently, or always involved in science homework assignments” (p. 329). These responses were similar to those of the parents (demonstrated by a significant and positive relationship between them). Overall, the TIPS students reported “significantly higher levels of family involvement in science homework than did students in noninteractive homework classes ($p < .001$)” (p. 331).

Prior science achievement had a strong positive influence on the return of homework assignments ($p < .01$). Homework return data also revealed that students were more likely to complete and return their homework when the assignments regularly involved family members. In regard to homework accuracy, there was a strong correlation between the percentage of homework returned and the accuracy of the returned homework ($p< .001$). TIPS students also returned more accurate assignments than the students in the noninteractive group ($p < .05$).

Student achievement analysis revealed that, “students in TIPS classes earned higher report card grades than did students in noninteractive homework classes” ($p < 333$). Van Voorhis (2003) also found that there was a significant correlation between completing more science homework and earning a higher science grade ($p < .001$). When asked about their attitudes toward the homework, 16% more TIPS students than non-TIPS students said their family members enjoyed working on the homework. Thirteen percent more TIPS students than non-TIPS students also agreed that, “they were able to talk about science work with a family partner” (p. 335). As well, more TIPS parents stated that their children were working as hard as they could in science.

Sirvani (2007) studied the effects of parental involvement on the mathematics achievement of high school freshman students. The sample size included 52 students, 33 male and 19 female, from four Algebra I classes taught by the same teacher. All of the students in these Algebra I classes completed the same tests, homework, and exams. This study focused on three measurements: the impact of parental involvement on student achievement, male and female differences with parental involvement, and the impact of parental involvement on lower-performing students who were scoring 75% or lower in math.

The four classes were divided into an experimental and a control group. The control group consisted of 22 students and the experimental group had 30 students. Students in the experimental group “received a monitoring sheet which reported students’ homework grades and test grades” (p. 35) twice a week to take home to their parents and receive their signatures. Students returned the forms within the next two days and this was repeated over the course of 12 weeks. All students completed 30 homework assignments, seven tests, and one exam; the final grade percentages were 10%, 70%, and 20%, respectively.

The Texas Assessment of Academic Skills, a benchmark assessment, was used to determine the previous mathematics knowledge or abilities between the four classes. This was completed by students near the end of the previous school year and the scores were used to make adjustments to the final data based upon previous significant relationships between the benchmark scores. An independent t-test determined that there were no significant differences between the academic levels of the four groups.

The first data analysis focused on the effects of parental involvement on student achievement. The mean scores for all homework assignments were significant ($p < .05$); whereas the experimental group had a mean of 75.64 and the control group had a mean of 49.51. Sirvani (2007) used a MANOVA test "which included seven test grades and the exam grade [which determined that] the treatment significantly improved students' tests and exam scores compared with student' scores in the control group" (p. 38). There were no significant differences found between genders for homework, test, or exam scores. Sixteen students in each group were classified as lower-performing students. The lower-performing students in the experimental group had significantly higher mean scores on the tests and exam than those in the control group.

Trautwein et al. (2009) conducted a study to examine how student homework effort, emotions towards homework, and achievement were related to teachers' homework objectives, implementation of assignments, and their views toward parental involvement. Participants included 1,299 Grade 8 students in Switzerland during the 2003-2004 school year and 63 teachers with a mean teaching experience of 17.5 years. Trautwein et al. (2009) had the

teachers and students complete questionnaires to gather information about the various data points.

The teacher questionnaire posed questions about “homework objectives, their homework implementation practices, and their attitudes toward parental homework involvement” using a four-point scale (p. 179). Four homework objectives were assessed including: drill and practice to diagnose student progress, closing the achievement gap, student motivation, and strengthening the school-home link between parents and students. The two homework implementation practices featured on the questionnaire were emphasis on student responsibility and controlling homework style. Student responsibility focused on the idea that students benefit most from completing homework and the controlling style focused on “using homework assignments extensively to control student effort and for student evaluation” (p. 180).

There were also two main attitudes towards parental involvement: the endorsement of parental homework control and support for student homework autonomy. The first stemmed from the teachers’ positive attitudes about giving parents more control over homework completion while the second viewed homework as helpful to students when completed on their own. Students completed their own questionnaires with similar four-point scales to gather information about student homework effort and negative homework emotions. A French achievement test was used as a standard achievement measure. All students completed one at the beginning of the year and one at the end of the year.

Trautwein et al. (2009) utilized multilevel regression analysis to “predict homework effort, negative homework emotions, homework expectancy beliefs, and homework value

beliefs" (p. 180). Descriptive analytics found that over the course of the school year, students experienced lower homework effort and increased negative feelings when doing homework ($p < .001$). Student French achievement also increased significantly over the school year. The analysis of teacher homework objectives indicated that teachers rated drill and practice the highest and the school-home link the lowest. Teacher homework implementation data concluded that student responsibility was the most important reason for assigning homework. Teachers' views on parental involvement revealed that the majority of teachers supported student homework autonomy as the ideal environment for homework completion.

Drill and practice assignments were negatively associated with homework effort and achievement. Teachers who strongly endorsed the enhancement of student motivation as their objective had favorable developments in homework effort and achievement. Significant positive relationships were also seen in homework effort and emotions for students of teachers believing that students should complete their homework on their own. In fact, Trautwein et al. (2009) identified, "The more teachers intended to establish a close link with parents and to involve them in the homework process, the less positive the student outcomes were" (p. 185). This was also reinforced by the significantly negative relationships found between achievement and increased parental involvement.

Trautwein et al. (2007) conducted a study about the effects of interindividual and intraindividual variables on student homework effort. The interindividual variables "help explain why some students put more effort into their homework than others" while the intraindividual variables focus on "within student variability in homework effort across different subjects" (p. 434). This study included 511 Grade 8 and 9 students who were randomly selected from 42

classes within nine different schools. Students were given a test booklet consisting of “a 7-minute test of basic cognitive abilities and a questionnaire section” (p. 435). This was completed at the beginning of the study.

Trautwein et al. (2007) used the booklets to gather data on homework effort, time, expectancy, value, quality and control as well as parental variables, basic cognitive abilities, and conscientiousness. High homework quality demonstrated that the teacher was knowledgeable about what homework to give to best support students. High homework control meant that teachers were more aware of which students were not completing homework. Prior school achievement was determined by grades from the midterm report card. Homework effort was assessed separately for all six subjects: German, English, history, biology, mathematics, and physics. Therefore, Trautwein et al. (2007) used hierarchical linear modeling for data analysis. Level one focused on individual student data across the six subjects, level two compared data between students, and level three examined the differences between classes.

Students reported the highest level of effort in mathematics and the lowest in physics. The subject with the highest expectancy beliefs was history while the highest perceived homework value was found in mathematics. Homework quality was rated highest for history and German had the highest homework control. Parents were most likely to help with mathematics homework as they found it to be an especially important subject. Overall, the within-student variables found that “students typically reported investing more effort in the subjects in which they perceived homework quality and control to be high, the subjects they assumed their parents considered important, and the subjects in which their prior achievement was relatively high” (p. 437). Students had increased homework effort in subjects for which they

had high expectancy and value beliefs. Students with high conscientiousness levels reported more effort on homework.

Supportive parent-child communication regarding school had a positive association with effort. Students in Grade 9 reported less effort than students in Grade 8, while school type had no statistically significant association with self-reported homework effort. Trautwein et al. (2007) determined that homework effort had a statistically significant association with homework time. Further analysis of homework time found that, “Students reported spending more time on those subjects in which perceived homework control was high and those subjects in which their last school grade was comparatively low” (p. 439). Homework expectancy had a negative association with time on homework and students with higher cognitive abilities spent less time on homework. Overall, there was a negative correlation between time on homework and achievement.

Bilige and Gan (2019) invited 4,222 eighth-grade students to complete an anonymous survey for the purpose of examining the influences of home-based parental involvement in education on child learning outcomes. The students were selected from 15 junior high schools in the Hainan Province of China. The survey included questions focused on students’ personal characteristics and parental involvement in their education at home.

Three of the primary variables of the study derived from these questions included parental involvement in home-based education, parents’ socioeconomic status, and academic achievement. The five areas of focus for parental involvement included: parent-child communication, home supervision, homework help, emotional support, and expectations. Parental socioeconomic status was determined from measures of parents’ educational

attainment and family income. Finally, academic achievement was determined by the midterm test scores of students from the 2018-2019 school year for seven classes: biology, Chinese, English, history, mathematics, morals, and physics.

The four types of home-based parental involvement used in this study were supportive, basic, strict, and disengaged. The supportive parental involvement group was the largest, comprising 70.18% of the families in this study. This group was categorized as "most likely of all the types to: (a) check the child's homework, supervise the child's homework, and assign extra homework; (b) communicate frequently with the child; (c) provide emotional support to the child; and (d) patiently tutor and communicate with the child" (p. 6). This group also had the lowest score in homework supervision. The second group was the basic home-based parental group; it comprised 19.77% of the families and was very similar to supportive families but did not score as strongly in all characteristics measurements. The strict home-based group included 7% of the families. Parents in this group had notable characteristics of supervising homework more often while having less involvement in "parent-child communication, emotional support, homework help, and expectations" (p. 6) than the supportive and basic groups. The final group was the disengaged home-based parental involvement group which had the smallest size of only 3.74% of the families. These parents had the lowest mean scores in all categories except homework supervision.

Two MANOVA were used to determine the relationships between the four types of home-based parental involvement and the educational attainment and income of the family. There was a significant difference between parents' socioeconomic status and type of involvement. Post hoc tests determined a significant difference in family income between

disengaged and strict parental involvement ($p < .001$). There was also a significant difference found “regarding parents’ educational attainment and family income according to type of involvement” (p. 7). The supportive parental group had the highest ranking for educational attainment and family income, followed by the basic and strict groups. Meanwhile, the disengaged group had the lowest educational attainment and family income.

Bilige and Gan (2019) performed an additional MANOVA to compare the home-based parental involvement type to students’ academic achievement scores. There were significant differences found for all seven class subjects by parental involvement type. Overall, the achievement scores were “highest among those whose parents were in the supportive home-based involvement in education group followed by the parents in the basic, strict, and disengaged groups” (p. 8).

Moroni et al. (2015) conducted a study to determine how the quantity and quality of parental help with homework affects students’ academic achievement. The study was conducted in Fribourg, Switzerland with 1,685 students in Grades 5 and 6 as well as 1,498 parents. The participants completed questionnaires during the study to gather information about quantity and quality of parental involvement with homework. The quality of homework was defined as “how often parents helped their children with homework across a time period of 1 week” (p. 420). Homework quality was categorized with two different dimensions differentiating between positive and negative forms of parental involvement: (1) involvement characterized by autonomy and emotional support (supportive involvement) and (2) involvement characterized by intrusiveness and control (intrusive involvement).

The first group of questions on the questionnaire focused on family background. These questions sought to gain information about immigration background based upon in which country the parents were born, parents' occupational status, highest parental education level, and number of books possessed by the family. Nine questions were used to determine the quality of parental homework involvement and to determine whether the involvement was supportive or intrusive. Responses to these questions were given on a five-point scale. The quantity of parental involvement in homework was determined by one question that asked students how often parents helped with homework per week. Finally, academic achievement was measured by a standardized achievement test in reading which was used as an objective measure of student achievement; whereas, the students' German grades were used as a more relevant measure of their current performance in school.

The quality of parental homework involvement was the first measure analyzed. Moroni et al. (2015) discovered "students who reported more supportive involvement showed higher reading achievement test scores and higher German grades, whereas students who reported more intrusive involvement showed lower reading achievement test scores and lower German grades" (p. 424). Also, a high correlation was found between intrusive involvement and the quantity of parental help. Analysis of the quality of parental assistance found a negative association between the quantity of parental involvement and reading achievement and German grades. Overall, more variance was explained by the quality of parental homework involvement rather than quantity in terms of predicting reading achievement and German grades.

Pomerantz et al. (2006) sought to examine the relationship between the mastery-oriented practices of parents' used during homework assistance on the emotional homework competencies of their children. The study included 114 grade 3-6 students and their mothers. All data was collected over a six-month period using questionnaires and daily interviews which were conducted over two weeks at the beginning and two weeks at the end of the study. The researchers interviewed the children and their parents separately by phone to gather answers about the homework for that day.

The parents were asked if their children had homework to complete and whether or not the parent helped or checked for mistakes. Parents also evaluated their extent of mastery-oriented assistance which included helping children understand the work or encouraging them to complete it on their own. The children answered many more questions focusing on perceived competence, mastery orientation, and positive and negative emotional functioning. Perceived competence was determined by a self rating by students of "how good they were in each of four school subjects (math, science, social studies, and language arts)" (p. 102). Mastery orientation determined whether students found importance in learning new material or if they liked completing difficult work in class. Positive emotional functioning focused on how often students felt positive emotions, how satisfied they were with their lives, and their levels of self-esteem and self-worth. Negative emotional functioning focused on how often students felt negative emotions, how often they experienced depressive symptoms, and how often they had anxiety symptoms.

Pomerantz et al. (2006) utilized two sets of hierarchical multiple regression analyses to determine the overall impact of maternal assistance with homework and maternal

mastery-oriented practices on their children. The analysis of maternal assistance found that "the higher mothers' assistance was, the lower was the negative emotional functioning among children with low perceived competence" (p. 104). However, this was not true among students with high perceived competence. Students' perceptions of their competence and negative emotional functioning decreased with more maternal assistance while low maternal assistance correlated to child perceptions being associated with daily negative emotional functioning ($p < .01$). A longitudinal analysis of the data found that increased maternal assistance with homework was a predictor of "dampened negative emotional functioning" (p. 104) in students.

Maternal mastery-oriented practice was associated with higher daily mastery orientation with children who had a negative competency but not for students having a high competency. Increased mastery oriented practice related to decreased association between children's perception of their competence and their mastery orientation. The longitudinal analysis found that maternal mastery practices predicted higher perceptions of competence over time for children with initially low perceptions in addition to heightened positive emotional functioning six months later.

Teacher Ideation and Student Conceptualization

Burris and Snead (2017) sought to contribute to the ongoing homework discussion by focusing on the student. Their goal was to have students complete open-ended surveys in order to better understand how students think and feel about the role of homework. This study consisted of 506 sixth through eighth-grade students from four metropolitan middle schools in the Southeastern United States. The survey consisted of seven questions:

> (1) why do you think teachers give you homework, (2) who do you think makes your teacher give you homework, (3) how much time do you spend each week doing homework, (4) does your teacher ever give you homework that needs technology like Internet or work processing, (5) how does your teacher grade your homework, (6) how much does your homework count in your final grade, and (7) anything else you would like to tell us about homework? (p. 198)

Once all of the surveys had been collected, Burris and Snead (2017) sorted responses to each question into groups based upon common themes which allowed for further analysis. Question one had a wide range of responses in regards to why students think teachers give them homework. Some responses were positive and focused on how homework will help them when they go to high school while others were negative stating that teachers assign homework because “Their boss tells them to” (p. 199). A quantitative analysis of this question revealed the primary categories: “help learn (169, 33%), practice/ review (104, 21%), busy work/have to/grades (58, 12%), assessment (60, 12%), punishment (48, 10%), improve/get better/get smarter (21, 4%), and a final category labeled as indiscernible (46, 8%)” (p. 200). In this data set, there were no significant differences found in regard to gender or grade level between the categories. Question two focused on who students believe makes teachers give out homework. The majority of students surveyed (301, 60%) stated that it was a combination of principal, district, parents, and teacher.

Question three included an array of responses about how much time students spend on homework each week. While some were in the extremes of zero or nine hours, the average amount of time was 3.45 hours per week among all 506 students. Question four could have

been answered as yes, no, or sometimes, in regard to students being assigned homework that requires technology. Forty-nine percent (246) said technology was required, 24% (120) did not need technology, and 27% (136) said technology was sometimes needed. Question five focused on how the teacher grades the homework. A few small groups of students identified the teacher (8%, 42), students (6%, 28), or both (4%, 22) as the sole graders of homework. The larger categories reflected student responses such as grading for participation/completion (10%, 49), accuracy (30%, 150), a combination of participation and accuracy (11%, 57), and other (24%, 119).

Question six asked students how much homework counted in their final grade. Thirty-two percent(162) of students claimed homework was not included in their final grade, while 27% (134) said it counted for 26%-50%. Twenty-two percent of the students stated homework was less than 25% of their grade, and 16% said homework counted for more than 51% of their final grade. Question seven included extra positive and negative responses from students about their homework. Some of the positives focused on teachers not assigning too much homework, while the negatives explained that being at school is long enough without having to do homework afterward.

Burris and Snead (2017) make a few implications based on the data retrieved from the open-ended surveys. One was that “there may be insufficient teacher attention given to the planning, implementation, and evaluation of homework” and that the goal of teachers should be to differentiate homework to “support students as they balance their motivation, time, and effort” (p.206). The data also reflected that students need differentiation with the social contexts of homework as some students prefer social groups while others work better on their

own. While many students were able to see the positive implications of homework it is ultimately up to the teacher to establish the “crucial link across school learning, homework, and future achievement” because “students perceiving a lack of relevance and control are less likely to commit their full efforts” (p. 203).

Davidovitch and Yavich (2017) conducted a study out of Ariel University, Israel in order to identify the perceptions about homework from students, teachers, and parents. For this study, homework was defined as “all study activities, tasks, and assignments that students perform outside the formal setting of the classroom, normally not in the presence of a teacher” (p. 90). The participants for each group were as follows: 110 students in Grades five and six, 36 parents between the ages of 25 and 65, and 35 teachers with years of experience ranging from 0 to 36 years. The participants for this study were from two different schools. One was a religious school located in a town in central Israel, and the other was a secular school located in a kibbutz, a rural town, in southern Israel. The breakdown of participants from the two schools was split evenly for all three groups with the exception of one additional teacher from the religious school. Data was gathered from closed and structured questionnaires that were distributed to the three groups. The questionnaires included “one closed part with structured questions and a second part with open-ended questions” (p. 94).

In order to analyze all of the data collected from the open-ended questionnaires, Davidovitch and Yavich (2017) separated the responses into categories for similar statements about homework. In the student breakdown a few of the categories included homework as a form of punishment and positive or negative feelings about homework. The parent group formed groups about helping their children with homework and the degree to which parents

should be involved in helping with homework. The teachers had the most unique categories with a few of them mentioning how homework was assigned, the effects of technology, and the overall effectiveness of homework. The methods used to analyze all of the data from these questionnaires included SPSS software, a t-test for independent samples, and Pearson's correlation.

The first results of the data analysis provided insights into the attitudes towards homework of the three groups. The teachers had the most positive attitudes (M=3.39), the students were in the middle (M=2.59), and the parents were the lowest (M=2.34). The attitudes of parents about homework based on religiosity revealed no significant difference. The use of the Pearson correlation to determine the relationship between teacher seniority and attitudes towards homework demonstrated a significant negative correlation between the two variables ($r = -.381$, $P < .05$). This means that as teachers experience increases, their attitudes toward homework decreases. The analysis of the differences between the two schools found significant differences in "teachers' attitudes toward homework ($p < .001$), such that those teaching at the religious school were found to have more positive attitudes towards homework than those teaching at the secular school" (p. 97). However, significant differences were also found in the attitudes of the students between the schools as students at the religious school had more negative views about homework than the students at the secular school ($p < .05$). When analyzing the descriptive results of the open-ended questionnaires, Davidovitch and Yavich (2017) found a notable difference between the religious and secular school about parent involvement in homework. The secular school had a wide range of responses about parent involvement with the large majority of teachers not believing there is "an essential need for

parent involvement in the academic field" (p. 105). Meanwhile, the religious school had a fairly common response, having noted that there should be some parent involvement, but it should not be too extreme.

Galyon et al. (2017) administered a study to determine if randomized credit contingencies focused on homework quality would result in higher quality answers than assessing all homework items for completion. They also focused on whether the improvement in quality of the homework would improve exam performance. Galyon et al. (2017) conducted this study with 62 students enrolled in an undergraduate psychology course at a southeastern state university which was broken into three sections consisting of 20, 23, and 19 students respectively. The students had an average GPA of 3.16, and 63.9% of the students were female.

The students were assigned 10-12 homework questions to complete after each class day. Homework was defined as "the completion of relatively small tasks outside of class that were then submitted to the instructor on a near-daily basis" (p. 64). Galyon et al. (2017) required the instructors to use two homework credit contingencies as the basis for grading the homework as they were the independent variables in the study. The first homework credit contingency was accuracy, this measured the amount of correct concepts given in the student response divided by the total concepts that were noted in the answer key for that question. The second was completion which accounted for the number of homework questions that were answered regardless of quality, as well as the length of the answers indicated by the amount of lines used in each answer of the selected questions. Each class was randomly assigned a homework contingency to determine how homework would be graded for the five units to be covered. This meant that "A represents the competition contingency and B represents that accuracy

contingency" (p. 69) and a class section could be assigned ABABA as their sequence to follow for the five units. Exam assessments were also taken at the end of each unit which consisted of 50 questions and were graded by an electronic test scanning machine. Students were also provided feedback with their accuracy scores once homework was completed.

Homework accuracy percentages were significantly different between the two contingencies ($p < .001$). The accuracy contingency had significantly higher accuracy percentages than the completion contingency. Also, a mixed ANCOVA controlling for the length of answers concluded that the accuracy contingency had significantly more accurate answers than the completion contingency ($p < .001$). The analysis of the completion of homework stated "the mean percentage of homework questions completed was slightly but significantly higher under the completion contingency than the accuracy contingency" (p. 71). A mixed ANOVA indicated significant differences in the length of homework answers under the two contingencies ($p < .001$) with the accuracy contingency having significantly longer answers than the completion contingency. The analysis of exam scores compared current students' test results to the historical average scores which reflected significantly higher scores under the accuracy contingency.

Wong (2001) conducted a study for the purpose of investigating "the effects of three formats of computer-based homework and the paper-based homework, on the achievement, retention, attitudes, and homework time of lower secondary students in Hong Kong" (p. 1). A secondary purpose of this study was to compare the data between the computer-based and paper-based homework to determine the most effective method. The study population included 187 lower secondary students who were chosen from five classes, one from each of

the five coeducational secondary schools in Hong Kong. The breakdown of students per group was 46 students in computer drill and practice, 46 students in computer games, 48 students in computer-aided discovery, and 37 in paper-based homework.

The computer drill and practice format allowed students to receive immediate feedback after answering questions and offered online help facilities for students to access. Students were able to receive hints to problems that they needed assistance with and were formulated to be positive toward the student. The computer game format presented homework problems in the form of games. These games allowed students to complete various math problems within the framework of an adventure game, a shopping game, and a matching game. Students in the computer-aided discovery group completed worksheets with the aid of software programs in order to find relationships between the variables they were solving for on their worksheets.

All students completed a mathematics achievement test and a math attitude test at the beginning of the study. Over the course of the study, all students completed their homework assignments after school with the supervision of Wong and research assistants. The homework questions for the paper-based and computer drill and practice groups were the same while the other groups had altered questions to fit their delivery format. In order to analyze retention, students completed a post test at the end of the study and another twelve weeks later.

Wong (2001) utilized ANCOVA in order to analyze the data determining the effects of these homework formats on student achievement, retention, student attitudes, and homework completion time. There were significant differences ($p < .001$) in mathematics achievement analysis “between the computer drill and practice group and computer-aided discovery and between the computer drill and practice group and the paper-based group” (p. 6). Computer

drill and practice outscored both of these groups and had a 32% higher frequency of correctly answered questions than the paper-based group. The data for retention found significant differences ($p < .001$) between computer drill and practice and computer-aided instruction as well as between computer drill and practice and the paper-based group. Overall, there were no significant findings in regards to student attitudes towards math homework and the four studied groups. Homework time analysis noted significant differences in time between computer drill and practice and computer games, computer drill and practice and computer aided discovery, paper-based and computer games, and paper-based and computer aided discovery ($p < .001$). The mean times for all four groups were 92.56 minutes for computer games, 86.27 minutes for computer-aided discovery, 50.35 for computer drill and practice, and 46.49 minutes for paper-based homework.

Martinez (2011) conducted a study to examine the academic benefits of completing homework assignments and the homework routines of Latino students. This study included 22 high school students, nine males and 13 females with an average age of 16, from a midwestern urban city. All participants were enrolled in the same summer school English class with a majority of them retaking the course to make up for a failing grade. Martinez investigated four aspects of Latino students' homework routines: "how much homework Latio students are assigned, whether Latino students complete all of their homework assignments on a daily basis, reasons students do not complete homework assignments, and support students seek when they experience difficulties completing homework assignments" (p. 356).

Martinez (2011) pulled all student participants from class to interview them about their parents' educational expectations, classroom experiences, family background, future academic

and professional plans, and student-teacher relationships. Students also provided responses to, “how much homework they were assigned on a daily basis, how much homework they completed on a daily basis, reasons for not completing homework assignments, and whether they turned to someone for help when completing homework assignments” (p. 357). Martinez then grouped all student responses from the interviews to determine any commonalities relating to completing homework assignments and the homework routines of Latino students.

Analysis of the student responses identified six areas that had an impact on homework completion: homework routines, problems with time management, lack of motivation, overwhelming amounts of homework, available help from parents, and the social support available for homework. In regard to homework routines, students said they spent between 30 minutes and two hours each day on homework with the average being about an hour. Only a third of the students said they would complete all of their homework and many of those students had the highest grades in the study population. Some students identified their own struggles with time management as a hindrance to their homework completion. Some acknowledged thinking that they could complete their homework in the morning before school started, while some would never bring homework home as they believed they could complete it during school hours.

Laziness and a misunderstanding of the importance of homework was a downfall for other students. Four students pointed out their lack of motivation to complete homework as they would rather hang out with their friends or watch tv at home. Some others just didn’t want to bring home books or other necessary school materials, and one student believed that teachers simply didn’t care whether or not students completed homework. This misconception

of homework stemmed from the transition from middle school to high school and led students to become overwhelmed by the amount of homework that they were assigned. Many students were also adjusting to the amount of courses they were taking; some believed they had too many to keep track of and complete.

Even if students did take their homework home, Martinez (2011) discovered that they had minimal support from their parents when they had questions and needed help. Nine students stated "they do not ask their parents for help with homework because their parents are not familiar with the material, do not have a strong grasp of the English language, or did not go to school" (p. 361). However, some students still asked their parents for support, despite their lack of content knowledge, in order to receive social support and encouragement from them. Of these, six students said they turned to their mothers for homework help because they would encourage them and provide suggestions about how to study.

Rosário et al. (2018) conducted a study to better understand how teachers observe students' homework habits in class and how teachers can improve homework support for students while increasing homework effectiveness. The researchers selected 47 teachers from 12 public schools. All of the participating teachers taught between three and five classes with an average of 27 students per class and had been teaching an average of 22 years. Teacher focus groups and classroom observations provided the data; then Rosário et al. (2018) identified common themes and subthemes between homework follow-up practices.

They conducted focus group discussions at the beginning of the school year; each had a duration of one hour. There were six groups in all; each group had seven to nine teachers. The goal of the focus groups was to analyze "participants' perspectives on a particular topic, a

greater understanding of how and why these opinions were formed, and more information on how these opinions are discussed among peers" (p. 96). The researchers conducted randomly selected classroom observations five times within a three week period with no prior notice to the teacher. The goal of the observations was "to learn more about teachers' homework follow-up practices implemented in class and the interactions between teachers and students likely to influence these practices" (p. 96).

Two pairs of researchers analyzed the data collected from the focus groups and observations who then identified the themes and subthemes that correlated to the teachers' responses. Each pair independently coded and grouped all responses into themes and subthemes and then shared their findings to make sure any discrepancies were found. Once both pairs came to a consensus about the responses, they presented the data to the participants to ensure it was an accurate representation. In all, they discovered three themes: "Homework follow-up practices, purposes of homework follow-up practices, and constraints to homework follow-up" (p. 97).

The analysis of homework follow-up practices focused on teachers checking homework on the board, homework completion, and providing individual feedback. Rosário et al. (2018) found that teachers spent between 3-55 minutes checking homework with the whole class by having a student or the teacher check the homework on the board. Another strategy teachers used to check homework was through whole class discussion, but classroom observations found that only a few students participated. Teachers also spent two to nine minutes on homework follow-up by asking the class whether or not they did their homework or by walking around and checking notebooks. Many teachers agreed that "providing written comments was the "ideal"

type of homework follow-up practice to provide specific cues about students' main errors" (p. 99), but only a few teachers reported using this strategy.

The second theme that arose during analysis was the teachers purposes for their homework follow-up practices. The primary reasons for teachers using their follow-up methods were "to become aware of their students' strengths and weaknesses, to promote their students' involvement, and to address their students' specific difficulties" (p. 100). When teachers had students check homework on the board, it demonstrated to the teacher that they fully understood the content. It also allowed the class to discuss related problem-solving strategies which benefited all students. Reviewing homework in class provided teachers with an opportunity to assess whether students were ready to move on to the next topic. A few teachers stated that "some students need to know that the teachers will check for homework completion in class; otherwise they are likely to miss it" (p. 101). Teachers also pointed to conferencing individually with students as an important strategy to provide specific instructions to improve learning.

The final theme among teachers was the constraints to homework follow-up. The large majority of constraints included "characteristics of the class, high workload, students' maladaptive homework behaviors, students' maladaptive homework follow-up behaviors, and pressure to follow the curriculum" (p. 102). No matter which follow-up practice teachers used, there always seemed to be a group of students who consistently seemed lost and required more time. While written feedback was the most ideal practice for many teachers, it was under utilized as teachers reported their class sizes were too large and they didn't have the time.

Some teachers also felt held back by the curriculum as they felt unable to take extra time to correct students because they had to move on to the next phase of content.

Dettmers et al. (2010) conducted a study during the 2003 and 2004 school years to identify the predictability of homework behavior, homework motivation, and mathematics achievement based upon homework quality. The two indicators of homework quality identified in this study were homework selection and homework challenge. Homework selection was defined as "the selection of appropriate and interesting homework tasks" while homework challenge "measures students' perceptions of the cognitive challenge inherent in the homework tasks" (p. 469). Dettmers et al. (2010) utilized data from the German extension to the Programme for International Student Assessment (PISA) which included 3,483 high school students in 9th and 10th grades from 155 classes.

Dettmers et al. (2010) utilized a theoretical model to predict the effort students put into their homework based upon homework expectancy and value beliefs. Homework expectancy reflected a "student's belief in being able to complete a given homework assignment successfully" (p. 468). Meanwhile, value beliefs described "students' reasons for doing a task in terms of their importance of succeeding in a specific domain, the enjoyment of engaging in the activity, the utility of the activity, and the costs associated with it" (p. 468). This model served as a framework to identify how homework effort may be related to achievement. Once all data had been collected from the PISA samples, the researchers used multilevel models "to predict homework motivation, homework behavior, and mathematics achievement" (p. 472).

Analysis of descriptives and zero-order correlations determined that students averaged 2.6 hours per week on math homework assignments. Homework motivation ratings were higher

than the scale average which indicated high motivation levels. Homework perception and quality analysis determined that, “students perceived their mathematics homework assignments as somewhat difficult and the quality of homework selection of middle to high quality” (p. 473). Homework challenge was negatively associated with homework effort, math achievement, homework expectancy, and value beliefs.

The final analysis identified the predictability of mathematics achievement based upon the many aspects of homework quality. At the student level, homework expectancy beliefs and homework effort did positively predict math achievement. In contrast, homework time was a negative predictor of student achievement and homework challenge had a significantly negative correlation to achievement ($p < .001$). Dettmers et al. (2010) determined that homework selection did not positively predict math achievement. Overall, classes that demonstrated a high homework quality had increased positive relationships to mathematics achievement.

Radhakrishnan et al. (2009) investigated homework incentives and their influence on homework completion and academic performance. Participants included 201 college students enrolled in a psychology course over three consecutive semesters. Students in the first semester class (n=66) were given 1.25% toward their final grade for completing their homework while students in the second and third semesters (n=135) only earned 0.45%. The same instructor taught each semester with the same method of teaching.

The primary assignment for students to complete was a three-minute oral presentation with visual aids to present in class. All out-of-class work that contributed to the presentation was submitted by the students as evidence of homework completion. This included solo rehearsals with a self evaluation and practice with a peer along with a peer evaluation focused

on the grading criteria of the presentation. All out-of-class work was collected by a research assistant and the instructor graded each presentation based upon the quality of content and delivery.

Students from the second and third semesters had their results combined as there was "no significant difference in final presentation scores or in homework submission rates between them" (p. 222). The first semester students who were given 1.25% toward their final grade for doing homework, performed significantly higher ($p < .03$) than those who earned 0.45%. The analysis of homework completion revealed that 85% of students in the high incentive group completed homework as opposed to 76% in the low incentive group. In contrast, only 22% of students from the high incentive group and 78% from the low incentive group did not complete their homework. However, there was "no performance difference between those who did or did not do their homework" (p. 222) and the relationship between homework completion and incentive group was not significant.

Simkin and Stiver (2016) conducted a study to determine the reliability of self-graded homework and its relationship with final exam scores. The subjects included 226 university students (80 women and 186 men) who were enrolled in an introductory information systems course. The study was conducted over seven consecutive semesters with the same instructor and all students were informed that "they were on the honor system" in regard to self-grading and that he would not challenge their grades (p. 53). Homework included 20-25% of the final course grade and the total points varied based on the amount of assigned questions and bonus questions which allowed students to potentially score higher than 100%.

At the beginning of each class, students would review the suggested solution for each homework question and determine their grade based on a table that provided maximum points for each question. An analysis of final homework grades found that 63% of students scored less than 100% and the overall average score was 87%. There was a statistically significant difference between the scores of men (88.1%) and women (84.5%) ($p < .01$). Simkin and Stiver (2016) sought to determine the reliability of the self-graded scores by using a prerequisite statistics course as a control in which the professor graded all homework. The comparison between the two groups found that the "means, medians, and modes differed between the two groups" in regards to homework score percentage (p. 55). The scores in the study classes were more dispersed with a lower minimum and larger sample deviation than the control. This result confirmed the reliability of the self-graded homework scores as Simkin and Stiver (2016) expected students to overinflate their scores.

The final exam in each class was a 50-question, multiple-choice test with little variation between semesters. A Pearson correlation coefficient was used to determine the relationship between the exam score and homework grade. Analysis determined that "the homework coefficient showed a statistically significant positive relationship with final exam scores" (p. 55).

Katz et al. (2010) conducted a study in order to examine the differences between middle school and elementary students in the areas of adaptive motivation, perception of teachers' support of the psychological needs of students, and the students' expressed level of needs in regard to homework. The participants were from two elementary schools and one junior high school in Israel, with a final count of 71 fourth-grade students and 108 eighth-grade students. All homework measures and data were taken from the students' Biblical studies class. Students

answered surveys “asking about their motivation for doing homework, their perceptions of their teacher’s behavior as supporting their psychological needs in the context of homework, and their needs in the context of homework” (p. 254). These were given during class time while no teachers were present. All answers on the surveys were given on a five-point scale.

The students’ adaptive motivation for doing homework determined whether students completed homework was based on controlled (external or introjected forces) or autonomous reasons (enjoyment or identified value). Students answered questions to assess their teachers’ support of autonomy, competence, and relatedness in regard to the behavior of teachers supporting the students’ psychological needs. Characteristics of teachers demonstrating autonomy included offering choices for homework, providing rationale for the task, and a clear understanding of the students’ perspective. Questions that assessed competence focused on whether teachers would help students plan their work or provide informative feedback to students. Questions that measured teacher relatedness stemmed from characteristics such as encouraging empathy in the classroom and minimizing competition between students. An exploratory factor analysis determined that all measures of teacher support for student psychological needs were loaded on one factor which accounted for 53% or the variance; therefore, Katz et al. (2010) decided to combine all three measures into one variable.

Questions regarding students’ expressed level of needs assessed “students’ needs for autonomy, relatedness, and competence in the context of homework” (p. 256). The foci were similar to the teachers’ support for students’ psychological needs questions, but now they focused on the students’ assessment of their own needs. These measures were also analyzed

with an exploratory factor analysis and were found to be loaded on one factor accounting for 43% of variance with a high correlation between all items.

Katz et al. (2010) broke down the results into descriptive statistics and results of the covariance analyses. The descriptive statistics revealed that school level was negatively correlated with perceived teacher support of students' needs, autonomous motivation, and level of expressed needs. School level was not correlated with controlled motivation while "teachers' support of students' needs was strongly and positively correlated" (p. 257) with autonomous and controlled motivation. Expressed level of needs was also positively correlated to autonomous and controlled motivation as well as teachers' support of students' needs.

The results of the covariance analyses determined that eighth-grade students reported lower autonomous motivation toward homework than fourth-grade students. The difference between the perceived teachers' support of students' needs in eighth-grade and fourth-grade students was statistically significant with eighth graders perceiving less teacher support. Katz et al. (2010) also found that "students in junior high school were less likely than students in elementary school to perceive teachers' support of needs" (p. 259) which was positively associated with autonomous motivation. This relationship was much higher with students who expressed a higher level of needs than those with a lower level.

Núñez et al. (2015) conducted a study to examine how student-perceived teacher feedback is related to the amount of assigned homework (HW) completed, time spent on homework, and time spent on homework management as well as academic achievement. The study included 454 students in grades 5-12 of which 48.5% were boys and 51.5% were girls.

Students completed questionnaires with sections relating to each variable. The questionnaires were administered and completed during a regular class.

The first variable measured by the questionnaire was perceptions of teacher involvement. This was determined by five items from the questionnaire including:

> (a) the teacher emphasized the importance of completing the HW; (b) in each class, the teacher checks whether students have done their HW; (c) the teachers takes HW into account when assigning final grades; (d) HW is corrected in class to fix the errors; and (e) the teacher gives students positive reinforcement when their HW is done. (p. 206)

All answers were given using a 5-point scale (1=strongly disagree, 5=strongly agree). The homework variables included the amount of homework completed, time spent on homework, and perceived quality of homework time management. Each of these variables were determined by three items on the questionnaire using a similar 5-point scale. Academic achievement was determined as a cumulative average of all final academic grades.

Núñez et al. (2015) utilized a two-way ANOVA to determine the effects of gender and grade level on teachers' HW feedback. Grade level was statistically significant in relation to teachers' feedback on homework while gender was not. HW feedback was found to decrease as grade level increased for both genders. Núñez et al. (2015) then used a full mediation model to determine any association between the homework variables and achievement. Perceived teacher homework feedback had a statistically significant and positive association with the amount of homework completed and perceived quality of homework time management. No significance was found between feedback and time spent on homework. There was also a statistically significant relationship between homework-related behaviors and academic

achievement. In fact, the analysis revealed that “20% of the variance in the students’ academic achievement was positively predicted by the amount of HW completed and by the perceived quality of HW time management, whereas it was negatively predicted by the amount of time spent on HW” (p. 211). A 23% variance in the amount of HW completed was related to HW feedback, time spent on HW, and perceived quality of HW time management.

Hwang et al. (2010) investigated the effects of reviewing annotations and homework solutions on learning achievement. The study included a class of 32 students in their first year of junior high school. All students were trained to use Virtual Pen (VPEN), which the researchers developed in 2004. It was designed to allow students to make annotations while studying and working on homework solutions; common student uses of the VPEN tools were the “comment box to solve their homework problems and to input text annotations” (p. 1021). Students were then able to review those annotations or share them with others. All students were trained to use VPEN before the study so that they were familiar with it. All data was collected weekly during one hour of math class, over the course of four months.

The study included ten variables which were divided into five groups: (1) mark annotations, (2) own text annotation, review, and involvement, (3) peers text annotations review, (4) own homework solutions, review, and involvement, and (5) peers homework solutions review. Group one included the amount of times students utilized underlining, highlighting, drawing figures or text markings to emphasize content. Group two focused on the number of text annotations, number of self annotation reviews, and the ratio between number of reviews and total annotations. Group three indicated the number of times a student reviewed annotations made by peers. Group four was similar to Group two while applied to

homework solutions. Group five noted the number of times a student reviewed peer annotations.

Interviews were conducted with the students in order to "understand the behaviour and attitudes of students regarding the reviewing of text annotations and homework solutions, both their own and those of their peers" (p. 1022). In order to ensure the reliability of the data, two experienced junior high mathematics teachers rated and coded all annotations and homework solutions and then compared their results. The reliability between the two was 0.85 and they developed a baseline for acceptable annotations and homework solutions. Annotations were selected based upon the inclusion of at least one mathematical concept of learning material, while homework solutions must have had at least one solution.

Hwang et al. (2010) analyzed the proportion of annotations to learning materials and homework solutions and found them to be 0.69 and 0.31 respectively. The analysis of mark annotations found "no significant correlation… between the quantity of mark annotations and learning achievements" (p. 1022). Group 2 results indicated that total text annotations and the quantity reviewed were significantly correlated with learning achievement. The number of self text annotations reviewed also had significance with learning achievement. The quantity of peer text annotations reviewed had no significance with learning achievement. A review of Group 4 data found that "The quantity of homework solutions [was] significantly correlated with learning achievement" (p. 1023). However, there was no significance between achievement and own homework solutions reviewed. The quantity of peers' homework solutions reviewed had no significance with learning achievement. An analysis of all variables in regard to their

predictability of learning achievement determined that the quantity of text annotations was the only significant variable.

Chapter III: Discussion and Conclusion

This study compiled the findings of 30 studies with the purpose of identifying connections between homework time and achievement, homework and home support, and teacher ideation and student conceptualization. These studies included a range of subjects from elementary school through college students and collected data through questionnaires or national data records. The results from each study were compiled into similar groups in order to analyze and evaluate the findings and conclusions.

Homework Time and Achievement

Fourteen of the 30 studies noted positive associations between homework time and academic achievement. Three of these studies found significant differences between females and males in regard to homework time; all three noted that females spent more time on homework (Kalenkoski and Pabilonia, 2017; Kitsantas et al., 2011; Won and Han, 2010). Kitsantas et al. (2011) found that males exceeded the mathematics achievement of females despite the higher homework time for females ($p < .001$), while Kalenkoski and Pabilonia (2017) found that females maintained a higher GPA and completed more homework than males each week. Six of the studies provided insight into the average amount of time students spent on homework each day and each week. Four such studies determined that students spent between 30 minutes and two and a half hours on daily homework; one hour was the average (Dettmers et al., 2010; Fernández-Alonso and Suárez-Álvarez, 2015; Maltese et al., 2012; Martinex, 2011). Kalenkoski and Pabilonia (2017) found that the average weekly time spent on homework for females was 7.6 hours and for males was 5.2 hours. Kitsantas et al. (2011) made a significant connection between homework time and race as Black and Hispanic students spent about 21%

and 16% more time, respectively, on homework than their White counterparts ($P < .001$). Chen and Stevenson (1989) provided international comparisons of homework time; they noted that first graders in Minneapolis completed one-third of the homework of Sendai first graders, and one seventh of the students in Taipei.

Parameters

Five studies identified ideal parameters for students in regard to daily and weekly homework time. Beck et al. (2017) determined the number of homework nights that resulted in the highest school grade was 3.79 nights per week. Three of these studies provided a range of 30-100 minutes as that which showed significant improvements in achievement as compared to students who completed no homework, as well as a more focused range of 60-90 minutes for optimal results (Change et al., 2014, Fernández-Alonso and Suárez-Álvarez, 2015; Maltese et al., 2012). Additionally, Rawson et al. (2017) demonstrated positive relationships between the total number of homework sessions, average time per problem, and problems attempted in relation to course grades.

Time Spent on Homework and Academic Achievement

Seven studies made clear connections between the significant positive correlation of increased time spent on homework and increased student academic achievement (Beck et al., 2017; Chen and Stevenson, 1989; Cooper et al., 1999; Kalenkoski and Pabilonia, 2017; Rawson et al., 2017; Simkin and Stiver, 2016; Van Voorhis, 2003). Beck et al. (2017) identified that parents had increased positive views on a school as homework nights increased. Teachers who assigned homework each day were predicted to have their students score 15% higher on tests than classes where homework was less frequent (Fernández-Alonso and Suárez-Álvarez (2015).

Time spent on homework was also found to be significantly linked to student self-efficacy, student homework effort, and homework expectancy (Kitsantas et al., 2011; Trautwein et al., 2007).

Negative Relationships to Homework Time

Nine of the 30 studies found there to be negative implications between time spent on homework and achievement. Six of those studies determined that homework time negatively predicted academic achievement, with another study finding no significant relationship at all (Chang et al., 2014; Chen and Stevenson, 1989; Cooper et al., 1999; Dettmers et al., 2010; Maltese et al., 2012; Núñez et al., 2015; Trautwein et al., 2007). Won and Han (2010) found no significance between high and low achievers and time spent on homework, as well as a negative association between homework and achievement in the United States. Chen and Stevenson (1989) also noted that students in the United States put in the minimal amount of time into homework and had no indication of enjoyment. Two studies examined the extremes of time spent on homework and found no significant differences in achievement between students who completed 0-30 minutes of homework to those who spent 120 minutes or more on homework (Fernández-Alonso and Suárez-Álvarez, 2015; Maltese et al., 2012).

Homework and Home Support

Nine of the 30 studies revealed positive relationships between homework and available support at home. Kinsantas et al. (2011) discovered that females had a significant difference in homework support resources compared to males ($p < .001$) and that White students had the most homework support resources compared to other racial categories. A negative association between homework support resources and time spent on homework was also found by

Kinsantas et al. (2011) ($p < .001$). Two studies conducted experiments with a homework regiment designed to include family support (Sirvani, 2007; Van Voorhis, 2003). Both of the studies found that the interactive groups performed significantly better than the control groups in terms of homework return, homework completion, homework accuracy, student achievement, and overall enjoyment of homework.

Trautwein et al. (2007) stated that students invested more effort in subjects they assumed their parents considered important. Bilige and Gan (2019) discovered significant differences between family income and type of parental involvement with the supportive parental group ranking highest in family income and the disengaged group ranking the lowest in educational attainment and family income. The achievement scores of students were reflected in the same way; the highest scores were associated with supportive homes followed by basic, strict, and disengaged groups. The four parental engagement groups were rated in areas of communication, homework supervision, providing emotional support, and willingness to tutor their child. Moroni et al. (2015) made similar conclusions as students with supportive home involvement obtained higher reading achievement scores.

Parental Assistance

Two studies identified maternal assistance at home to be crucial to student success with homework (Martinez, 2011; Pomerantz et al., 2006). Both of these studies found that students would turn to their mothers for encouragement and that increased maternal assistance was linked to a decrease in negative emotional functioning and low perceived competence in students. Beck et al. (2017) discovered that homework assistance from the father was strongly correlated to student GPA throughout the school year.

Negative Relationships Between Home Support and Homework

Six studies revealed negative correlations between home support and homework. Three of these studies stated that increased parental involvement was negatively associated with student achievement (Chen and Stevenson, 1989; Moroni et al., 2015; Trautwein et al., 2009). Moroni et al. (2015) concluded that intrusive parental involvement was highly correlated with the quantity of parental help and resulted in lower reading achievement scores for students in that environment. Beck et al. (2017) noted that students of single mothers reported significantly less homework than other students ($P < .01$). Cooper et al. (1999) found that an adult presence at home when students returned from school had no relationship with any achievement measure. Trautwein et al. (2009) revealed that teachers' preferred student autonomy as the ideal homework environment over parental involvement; in fact, the increased attempts to establish close links with parental involvement lead to more negative student outcomes. Martinez (2011) identified common barriers that prevent students from asking parents for help as the parents are unfamiliar with the material, did not attend school, or are unfamiliar with the English language.

Teacher Ideation and Student Conceptualization

Fifteen out of 30 studies provided insights into teacher ideation, student conceptualization, and ideal homework format in regard to the academic achievement of students. Murillo and Martinez-Garrido (2014) determined that 35-38% of teachers assigned homework in all of their classes. Three studies noted positive associations between daily teacher assigned homework, homework quality, and homework corrected by the teacher with student academic achievement (Dettmers et al., 2010; Fernández-Alonso and Suárez-Álvarez,

2015; Murillo and Martinez-Garrido, 2014). Chen and Stevenson (1989) compared teachers in the United States to those in China, Japan, and Taiwan and found that American teachers had the lowest rating of homework importance; whereas, teachers from other countries assigned two to four times more homework than American teachers. In a survey of parents, students, and teachers, the teachers had the most positive attitudes toward homework (Davidovitch and Yavich, 2017). This study also noted that teachers in religious schools had more positive attitudes toward homework than those in secular schools.

Five studies identified key strategies for teachers to engage their students for optimal homework success. These strategies included the need for teachers to provide differentiated assignments for students and establish content relevancy in order to maintain student motivation and effort (Burris and Snead, 2017; Trautwein et al., 2009). Two studies identified drill and practice homework methods as the most effective in terms of higher frequency of correct answers, lower homework completion times, and retention (Trautwein et al., 2009; Wong, 2001). Galyon et al. (2017) concluded that an accuracy-based homework approach resulted in increased homework accuracy, completion, length of answers, and test scores compared to a completion approach. Two studies identified teacher ideation in regard to homework follow-up and feedback. Rosário et al. (2018) discovered that teachers utilized between 3-55 minutes to check homework and follow-up on previous assignments. Teachers in this study identified the most ideal follow-up practice as the provision of written comments on each assignment but noted that time constraints often limited this practice. Núñez et al. (2015) discovered a decrease in teacher homework feedback as student grade level increased. Also,

perceived teacher homework feedback was positively associated with the amount and quality of homework completed by students.

Two studies identified student autonomy to be linked to teachers' support of students' needs and academic achievement. Katz et al. (2010) noted that student perception of teacher support decreased as grade level increased. This change prompted students to become more autonomous and self-reliant. Fernández-Alonso and Suárez-Álvarez (2015) concluded that autonomous students spent less time on homework and achieved higher scores than students who required more help. Autonomous students homework completion combined with daily homework assignments predicted increased scores by 27%. Self-efficacy also increases in autonomous students which was significantly correlated to mathematics achievement ($p < .001$) (Kitsantas et al., 2011). Hwang et al. (2010) revealed that an increased review of self-completed work and the work of their classmates was significantly correlated with student learning achievement. Student's who enjoyed homework had positive relationships with enjoying school and were also motivated to complete homework in subjects that they previously received a low grade in (Chen and Stevenson , 1989; Trautwein et al., 2007).

Negative Relationships in Teacher Ideation and Student Conceptualization

Nine of the studies identified negative relationships between teacher strategies and student attitudes in regard to homework. Two such studies found no significant differences between homework incentive groups and homework completion or student attitudes toward homework (Radhakrishnan et al., 2009; Wong, 2001). Radhakrishnan et al. (2009) also noted no achievement differences between students who completed their homework and those who did not. Davidovitch and Yavich (2017) discovered that as teacher seniority increased, positive

attitudes toward homework decreased ($p < .05$). This study also determined that students in a religious school had significantly more negative views toward homework than students in a secular school ($p < .05$).

Student Autonomy

In regard to student autonomy, Katz et al. (2010) revealed a negative correlation between school level and autonomous motivation, with eighth-grade students reporting lower levels than fourth-grade students. Some students cited many of their own struggles with time management, lack of motivation, and procrastination as reasons for not completing homework (Martinez, 2011). Homework challenge over the course of the school year was negatively associated with homework effort and led to increased negative feelings felt by students while completing homework (Dettmers et al., 2010; Trautwein et al., 2009). Teacher homework practices including homework selection and drill and practice assignments were negatively correlated to achievement, while homework feedback had no significance with time spent on homework (Dettmers et al., 2010; Núñez et al., 2015; Trautwein et al., 2009). Hwang et al. (2010) identified no significance between the review of self and peer text annotations with learning achievement.

Professional Application

Based on the findings of these studies, homework was shown to be significantly related to student academic achievement and I believe it will play an essential role in my teaching practices in the future. One of my goals for this study was to determine how often or how much homework should be assigned to students. These results have given me the ideal parameters of 60-90 minutes of homework each night over the course of four days each week. However, this

accounts for all homework assignments in all classes which brings my classroom-specific allotment to 15-20 minutes. While much of the data has concluded that homework time is beneficial to achievement, other studies also identified too much homework time as useless or even detrimental to student achievement. It is my goal as an educator to keep this in mind as I plan for how much time students will need to complete assignments. This means that if I am to assign lengthy homework assignments, I should be sure to give students plenty of in class time to complete them as well, so that they are not required to spend too much time on homework outside of school.

Many of these studies attempted to identify the optimal method of homework for students to complete or for teachers to implement as a strategy to engage students. Studies of the more traditional homework practices found drill and practice to be the most effective. This method is still widely used today and its merits were proven in those studies.

One of the findings that intrigued me was the role of parental involvement in the homework process. It will be important to utilize assignments throughout the year that involve parents in the learning process as it allows families to practice working together and gives parents an easy access point into their students academic life. However, I also recognize the struggles that were highlighted within a few studies about the wide range of home support that is available to students. It may be a big burden to ask students to involve their families in some assignments if their parents work late, do not have a healthy family dynamic, or move around a lot. It will be important for me to be conscientious about those students and differentiate accordingly.

A few of the studies compared homework data from the United States to other countries and found that we often assign a comparably low amount of homework. However, one of the issues I hear from students is that they already feel overwhelmed by the amount of homework they currently receive. Aside from a massive cultural shift of the acceptance of increased homework, I think this should be a sign to educators that we need to reevaluate what we deem as necessary homework and I think this year of navigating distance learning has helped us to do so. It has allowed us to trim away many assignments that we determined to be insignificant to our primary standards. Now that we have cleared some space in our lessons, we can replace those gaps with new assignments that provide students with rich learning experiences without the overwhelming pressure of hours of daily homework. The more we can integrate our assignments into our instructional time, the more students will be able to build upon new content and still have plenty of freetime at home.

Limitations

The studies included in this evaluation covered a wide range of data analysis and subject demographics which provide many limitations to this specific study. The subjects involved in these studies included students from elementary schools through college. While many of the studies focused on the middle school demographic, it is difficult to apply the findings of these studies to a specific student grade-level population. Most studies did their best to account for subject demographics including race, gender, socio-economic status, family income, and home environment. However, the broad range of subjects, including those from other countries, rural towns, metropolitan areas, private schools, and public schools, did not allow these findings to be applied to a specific population.

Study type and length are additional areas of limitation for the application of these findings. A majority of the studies utilized questionnaires given to parents, students, and teachers to collect data but the absence of a standardized questionnaire being shared between the studies allows room for variance in the application of those findings. Study length also limits this application as some studies were conducted in real time over the course of a few days, weeks, or months, while others analyzed data that was collected over previous years for national or international studies. Most of these studies included homework of various types which can account for differences in data collection and analysis. Some studies designed specialized homework assignments which were the sole focus of data collection while others included all homework assignments completed by students during a regular school week. Many of these studies focused on homework and achievement related to science and mathematics classes, but others included data from language specific courses, reading, English, or were not specified to a single subject.

Implications for Future Research

The studies used in this review have revealed important themes that would benefit from future research. An interesting approach could be to identify the effects of distance learning on parental involvement over this last year of many students being at home all day for school. This could identify if students excelled more from parents who checked in often with their child or those who trusted their children to be independent and not step in at all. This could also open up research into family dynamics at home and how that affected student learning as they balanced school and home life at the same time.

One area of research to expound upon is the amount of time students spend on schoolwork while accounting for all classes they are involved in. Many of these studies only focused on a singular class and possibly an additional one. However, students often attend six to eight classes a day, and they are often unaware of the workload each class places on their students. Performing a study that encompasses an entire school or grade level and identifies the specifics of homework time could provide valuable insight into accurate measures of daily and weekly homework time.

A few of the studies that utilized college students involved more unique approaches to homework, such as incentivizing homework completion or trusting students to grade their own homework. An interesting realm of future research would be to bring those strategies to classrooms of primary and secondary school students and identify how it relates to their achievement. Lastly, the rise in technology use in the classrooms and at home opens up great opportunities to discover whether this leads to longer or shorter homework times. Technology use can streamline many assignments, but it can also be a hindrance if students encounter errors, or if they are easily distracted by the many features available to them. Another approach could study one class using technology and another using paper materials to identify if there are any differences in achievement or homework time between the classes. This could offer valuable insight into how teachers can use technology more effectively in the classroom and prepare students for success with technology use at home.

Conclusion

The goal of this literature review was to provide a deeper understanding of the role homework plays in student achievement and identify best practices to apply as a classroom

teacher. Overall, time spent on homework was positively correlated with student academic achievement. This correlation, combined with ideal parameters of ideal homework time, will provide students with the optimal environment to increase achievement in test scores and GPA measurements. The involvement of parents in homework assignments had significant impacts on achievement and homework completion which encourages teachers to find ways to involve student families in their assignments. Supportive home environments were found to be the most effective at improving student achievement and feelings toward homework and their own academic competence. However, many disparities were discovered in home environments across racial and socioeconomic lines. These disadvantages should be known to teachers as they identify how to provide additional support to their students. The focus of teachers, in regard to homework, should be to encourage student accuracy and allow time in class to review previous assignments. This allows students to highlight what they know and reinforce topics with which they still struggle. Student autonomy should be encouraged, but it is important for teachers to allow students to do this at their own pace and to differentiate assignments accordingly. Teachers should be aware of their students' feelings and attitudes toward their class and homework throughout the year. The ability to recognize when students need a break or catch-up days is crucial to ensure that they stay engaged and know that teachers are aware of their needs.

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