

Suitable Homework Boosts Highschool Learning Effects

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Abstract

Highschool homework as an integral part of the study skills benefits students' learning outcomes significantly. Consistency of completing homework contributes to rising scores in any given assignment such as quizzes, regular tests, standardized tests, etc. The purpose of homework aims at different targets and it is designed for specific groups and occasions. Generally, there are four types of homework: a) Practice, b) Preparatory, c) Extension, and d) Integration. On the other hand, there is a great variety of homework with various tasks. The daily length of the high school assignments is within the frame time of ninety minutes to three hours. Too long or too short time consuming on completing the task does not result effectively in positive learning outcomes. The optimal time for completing an assignment resonates with the Aristotle mean, and it provides maximum benefits in learning outcome. Despite the fact of the dispute between education stockholders on benefits of homework, they still agree that homework elevates study skills to a certain degree with regard to the exams or study skills.

Keywords: highschool, homework, tests, optimal, assignments, increases, scores

1. Introduction

The paper elaborates articles about advantages and disadvantages of homework. In general, the benefits of homework as an integral part of education (from elementary to secondary) is debatable within the scholar circle and broader. Nonetheless, researchers do not dispute that homework provides students with higher grades in standardized tests in secondary education. Homework is good or bad for learning outcomes depending on the researchers' perspective. Although many problems turn out to have several solutions (the means to close the gap or correct the deviation) (Bwisa, 2018). In my perspective, and based on the facts that I have access as a teacher, the right homework for the adequate target can accomplish its aim thoroughly. Homework has multiple purposes, and depends on the situation and students' academic level. Homework assignments rarely reflect a single purpose (Cooper, 2006). In general there are four types of homework: a) Practice, b) Preparatory, c) Extension, and Integration. On the other hand, there is a great variety of homework with various targets. In most cases, the right amount of assigned homework is given as an extension of the lesson (daily instruction), and the objective is understanding the lesson deeper. Most Likely, students will dive deeper into the content of the delivered lesson. Despite the fact that homework might have minor disadvantages, benefits of homework still are omnipresent in education and in training institutions.

2. Method

2.1 Review of Relevant Studies and Theories

Researchers examined the effect of homework in learning from different angles, and their outcome reflects positive, negative, and mixed sides. The advantages of homework centers on the following arguments; homework helps consolidate learning, allows practice of skills, allows knowledge retrieval, allows students to prepare for future lessons, builds independent learning skills, develops other skills such as self regulation and organizations, etc. Disadvantages of homework centers on following arguments; tasks are often too long, tasks are often poorly devised, homework is set for the sake of it, students may copy each other's homework, parents may help students complete the homework, take the opportunity to rest and play, etc. Anti-homework advocates go further by saying homework does not improve educational outcomes (Nixon, 2015). Analyzing arguments pro homework and anti homework arguments, we might find out whether homework is worth applying at the highschool level or not.

Analyzing homework, I will start with the arguments pro-homework based on the statements in figure 1. **Homework helps consolidate learning** in several aspects. High school homework contributes to making students more independent on researching learning resources. In addition, it makes students more independent in preparing for exams and completing assignments. Homework gives students self discipline and responsibility. Since homework occurs periodically, students select a spot at home at a convenient time to complete homework systematically. When you study at the same time each day and each week, your studying will become part of your life (Loveless, n.d). Moreover, homework as a booster of study habits builds a positive behavior (discipline), which inspires students diligence to accomplish any given exam successfully.

Another relevant pro homework argument that is worth analyzing is **Allows students to prepare for future lessons**. As I mentioned early in the paper, homework might be given for various purposes. Let's assume, the given homework requires us to read a topic before a teacher delivers the lesson. While students read the topic, they might see many variables that are not familiar to the students, nonetheless, students will try to understand possibly a part of the reading passage. They will encounter difficulties to understand the whole topic; whenever they do not understand, students will take notes. The next day, the curiosity of students will be greater to ask questions (about the parts of the topic they did not understand), and they will find the desired answers. Asking questions works because it makes you an active learner instead of a passive recipient of information (Rasmussen, 2021). Even homework that is given as reinforcement of instructions, students will not find all the answers. As a result, they will ask questions about unanswered questions to find in the next class then students will become better active learners.

Another factor for assigning homework would be **to give parents an opportunity to see what their children are learning**. Usually, parents want to be sure what students study in the class; homework gives access to parents to see the content of each lesson, so parents might see the quality of the entire curriculum.

<i>Arguments for homework</i>	<i>Arguments against homework</i>
<ul style="list-style-type: none"> • Helps consolidate learning • Allows practice of skills • Allows knowledge retrieval • Allows pupils to prepare for future lessons • Allows pupils to prepare or revise for important assessments or exams • Allows pupils to further research the subjects and topics they are interested in • Builds independent learning skills • Develops other skills, such as self-regulation and good organisation • Makes use of resources outside of school, such as libraries • Gives parents an opportunity to see what their children are learning • Gives parents an opportunity to help their children • Allows home-school communication 	<ul style="list-style-type: none"> • Tasks are often too long • Tasks are often poorly devised • The school day is long enough • Homework is set for the sake of it • Pupils may copy each other's homework • Parents may help pupils complete tasks • Some parents can help their children whilst others find it difficult • Some parents cannot afford the best equipment and/or resources to help their children • Causes arguments between children and parents • Takes away opportunities to rest and play • Prevents children from taking part in activities outside of school, including sports clubs

Figure 1. Arguments of the Advantages and Disadvantages of Homework

The figure is taken from (Jones, 2022)

Teachers can foster parental involvement through direct requests for involvement in children's education (Dettmers, Yotyodying, and Jotkamann, 2019). When parents are content with the learning material that they convince them through viewing homework, they will involve themselves in children's education. If parents have a level of education that allows them to help children with homework, they will participate actively in helping with completing homework.

Otherwise, they will leave their children little longer in the school for tutoring sessions, and they will complete homework with tutors assistance.

The definition of the work is not unique; there are many definitions of homework, According to physics the definition of work states, “In general, for work to occur, a force has to be exerted on an object causing it to move” (Thought.co, n.d). Similarly, homework requires us to spend thinking energy, time, and preventing children from some activities outside of the class. All arguments of the opponents of homework resonate with long time taking with the work in general. Even if students do not have assigned homework, they should prepare for the exams (quizzes, tests, SAT tests, etc). In order to take exams, students need to study at home long enough until they feel they are prepared to take the exam. More academically inclined students, who get better grades regardless, may complete their homework more conscientiously (Guo et.al., 2021). Organizing study time for homework and studying for exams will take less time to be prepared for the exam; homework promotes learning in general (in high school) and yields the study smart methods by exposing the myth - homework does not make any difference in learning.

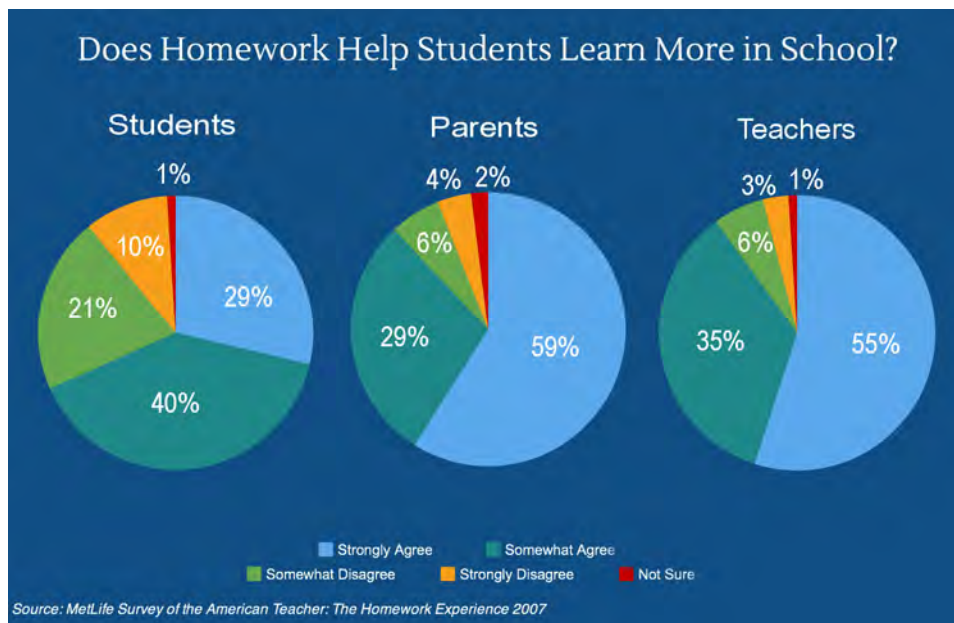


Figure 2. Metlife Survey of the American Teacher: The Homework Experience 2007

The figure is taken from (Walker, 2015)

Another interesting study from Survey of American Teachers illustrates in Figure 2 differences between teachers, parents and students on viewing homework as a factor that helps students’ learning. Mathematically speaking, students, teachers and parents somewhat agree to strongly agree (homework helps students learn more in school) with the percentages (69% to 90%).

CHART 1 PIRLS 2011¹ – Reading achievement scores by amount of time spent per day on homework (as reported by parents or primary caregivers)

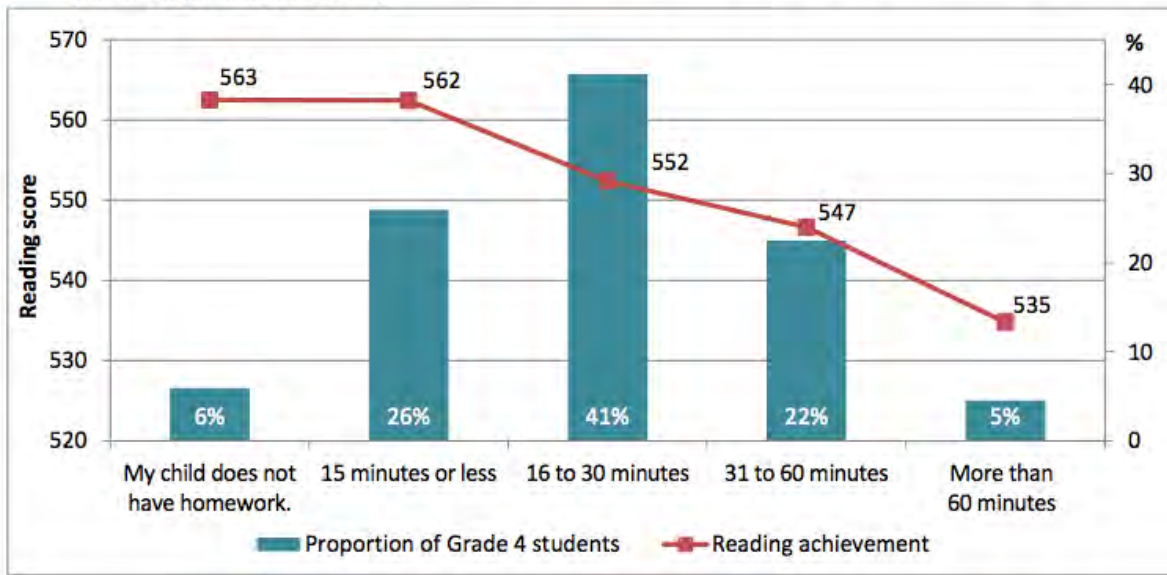


Figure 3. The Figure Shows a Correlation of the Optimal Time Spending on Homework and Reading Scores of Grade 4 Students (Nixon, 2015).

Students’ biggest issue with homework is long time consuming. Pope and Galloway recently surveyed more than 4,300 students from 10 high-achieving high schools. Students reported bringing home an average of just over three hours of homework nightly (Galloway, Conner, and Pope, 2013). In general average highschool students spend 1.5 to 2.5 hours daily on homework. When we compare high achieving high schools and average achieving high schools the difference does not seem so large. Nonetheless the small difference of spending on homework plays a key role in making huge differences on the learning outcome. The Program for International Student Assessment (Pisa) analyzed the amount of the homework given to high school students and compared it with the students’ scores of the test performances from PISA. For instance, ... (Pisa) suggests pupils in China are given the largest amount of homework, and they are among the highest achievers academically (Morris, 2018). According to the article,

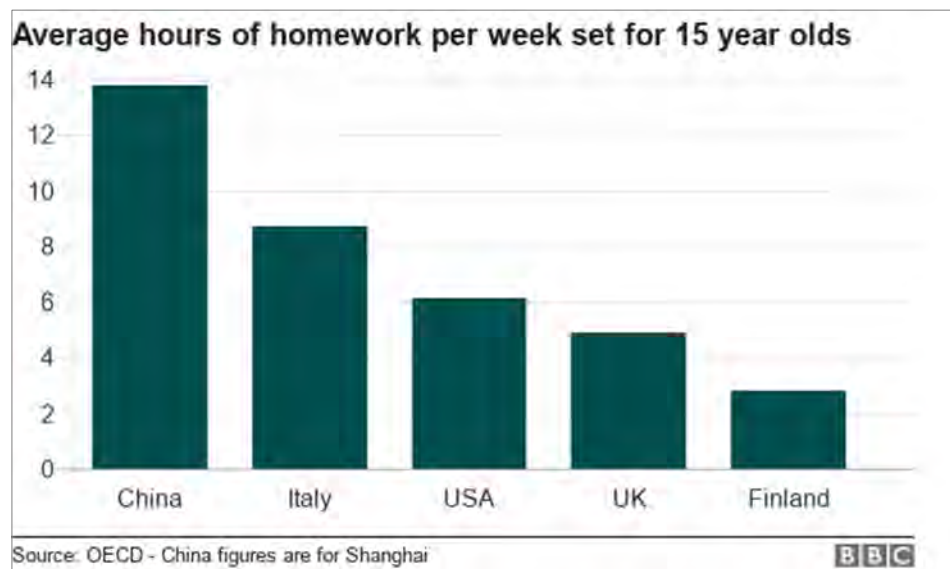


Figure 4. Average of Homework for Several Countries, the Figure is Taken from (Morris, 2018)

In China Average hours of homework per week set for 15 years data correlates with average scores from PISA assessment. On the other hand, data (Average hours of homework per week set for 15 years data and average scores from PISA assessment data) of Italy, USA, UK, Finland do not have a positive correlation between scores and homework. For instance, students in Italy get more homework than USA, UK, and Finland students, but students in Italy get lower scores in PISA assessment. Superficially analyzing graphs of Italy, USA, UK, and China. In Finland, we might get the impression the less homework students get, the higher scores performance students get in PISA assessment. Nevertheless, finding the correlation between homework and standardized tests requires a deeper analysis.

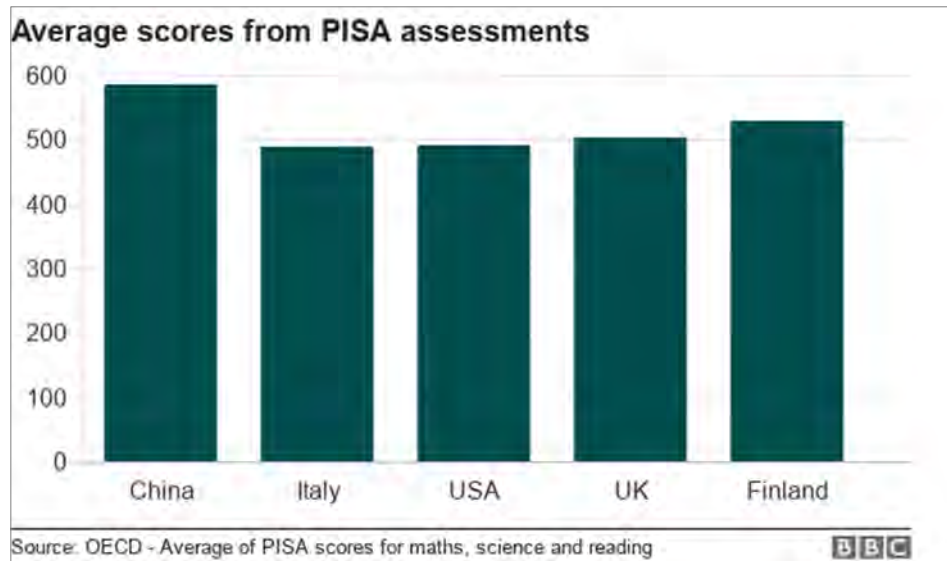


Figure 5. Average Scores from PISA Assessment for Several Countries, the Figure is Taken from (Chris, 2018).

The relationship of quality of the homework increases scores in standardized tests, which might be analyzed with mixed methods. For instance, in my lesson plan as (DOW NOW), I include at least one example from SAT, and the rest of the lesson aligns with the curriculum in my algebra 2 class. Also, I posted the SAT examples in PowerPoint, and I tell students which SAT examples we are going to analyze this week. Students' homework is to analyze each example before they come to class. My expectations are that students will be familiar with math SAT strategies on solving math problems. My teaching philosophy centers around the idea that whatever you practice (aptitude) more in a subject, you will get better results in the subject. In a recent study of Spanish students, Rubén Fernández-Alonso, PhD, and colleagues found that students who were regularly assigned math and science homework scored higher on standardized tests (Veir, 2016). The quantity of homework assigned provides students with greater grades in the standardized tests, but homework questions should be given similar to the standardized tests questions if we want better results (scores). Also, the optimal time (the right amount of time consumed on homework) spent on homework results with higher quality of the learning outcome. Still, it may also be the case that the effect is not linear. Some evidence has shown that academic performance increases with the increase in homework time, but begins to decline when homework time exceeds the optimal amount of time (Reteig et al., 2019). The optimal time spent on homework has a close relationship with Aristotle's golden mean; therefore, crossing the optimal time does not reflect a positive learning outcome.

3. Discussion

According to the figure 6 below, kindergarten to second graders spend 10 to 20 minutes completing homework each day (week days). Third to sixth graders spend around 30 to 60 minutes completing homework each day (week days). Junior high school students spend 90 minutes completing homework each day (week days). High school students spend 1.5 to 2.5 hours completing homework each day (week days). Many school district policies state that high school students should expect about 30 minutes of homework for each academic course they take, a bit more for honors or advanced placement courses (Harris, September 2006). Optimal time for completing the homework is 30 minutes of

work without interruption, taking the time, and continuing the next 30 minutes of work, and so on. Working with the discontinuous interval after 30 minutes of study, and taking a break enhances the quality of homework significantly.

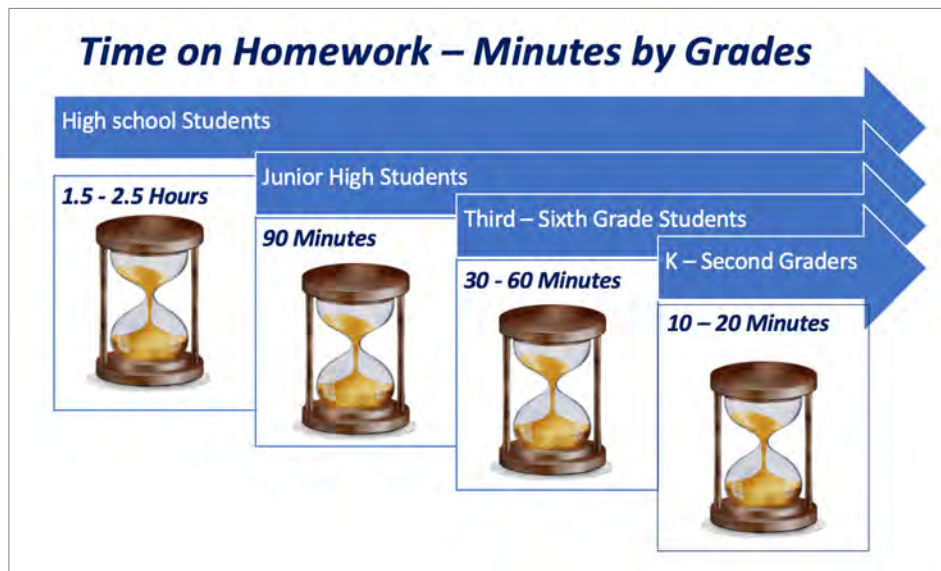


Figure 6. Length of Time Spent with Respect to Grades Based on Harris Cooper, September 23, 2006

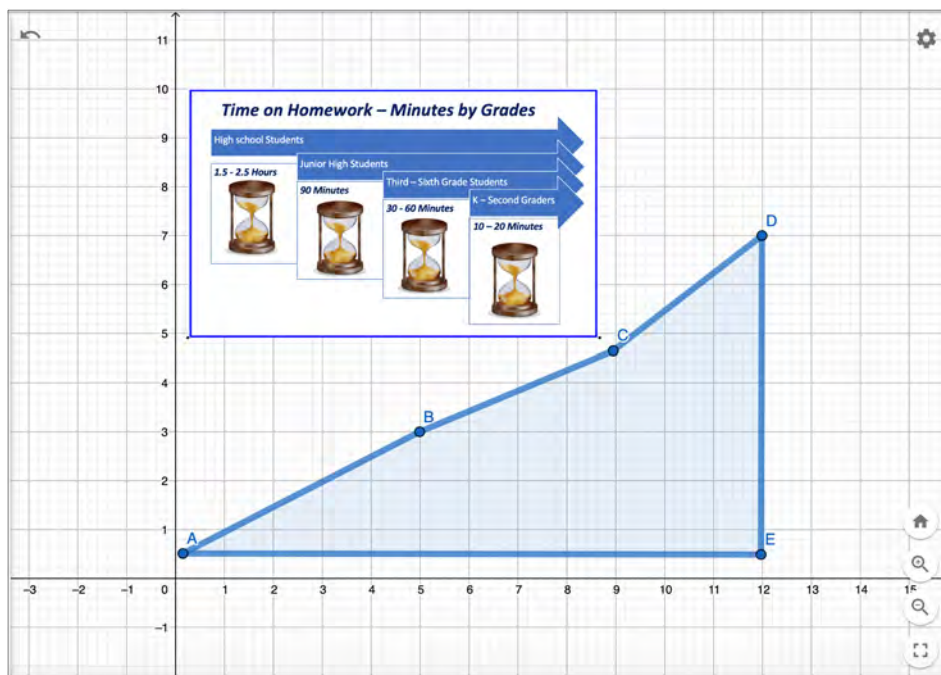


Figure 7. Modification - Length of Time Spent with respect to Grades Based on Harris Cooper, September 23, 2006

Homework has multiple purposes: lengths, complexity, and objectives. Teachers assign homework for multiple reasons: a tool to reinforce learning, build fluency, extend student practice and thinking, prepare students for the upcoming lesson, and more (Ties Center, n.d.). In general there are four common types of homework: a) Practice, b) Preparatory, c) Extension, and Integration.

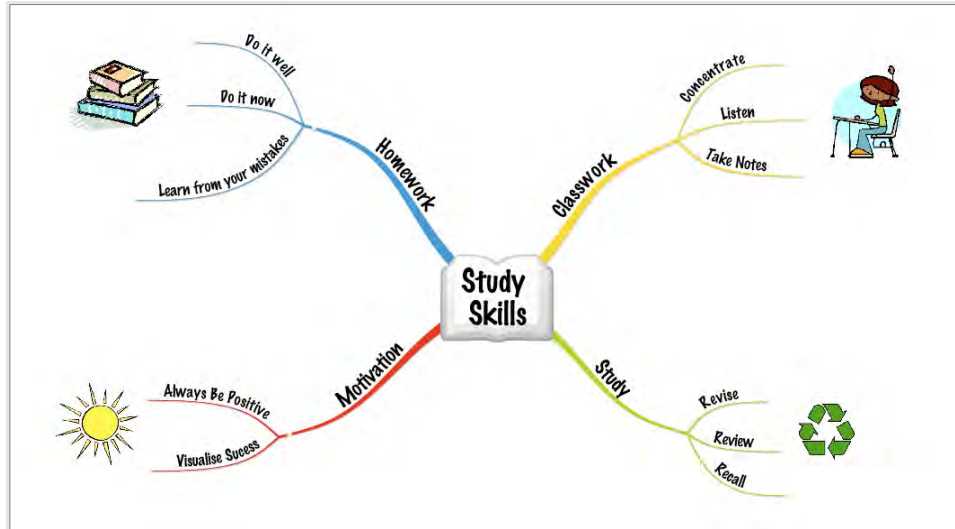


Figure 8. Homework is a Crucial Part of the Study Skills (The Learning Clinic, n.d)

Practice - common homework to enforce or foster the lesson plan or sessions. Usually, students understand the lesson during a session, but they need to practice at home in order to master the topic or lesson.

Preparatory - students will practice with the ideas or concepts that will be introduced in the upcoming lesson.

Extension - Teachers challenge students by giving homework on related concepts with the lesson plan. When teachers want to differentiate teaching, they might give extra homework to advanced students to extend their learning skills.

Integration - Homework that requires integrating different skills in a single skill. For example, assigning projects that integrate several concepts in a single work.

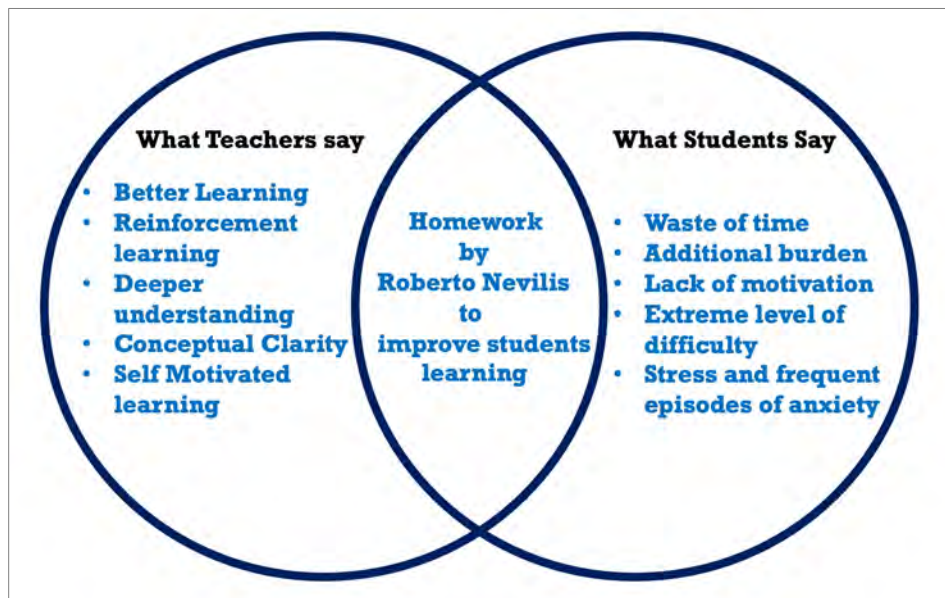


Figure 9. Teachers' Arguments on Homework vs Students

The figure is modified from (TutorBin, n.d.)

In general, students' study skills center on four main factors: homework, classwork, motivation, and study (preparing for the assignments). If we take in consideration equal participation of all factors in the study skills, homework contributes twenty five percent within the study skills. Flexibility of homework takes a great variety of assignments (above are just four common types), as a result, homework participates with a greater percentage on the study skills than other three relevant factors (classwork, motivation, and study) individually.

4. Results

Based on several articles that explore benefits of homework in education produces several significant results:

- Suitable homework - average length with adequate quality of content related to the exams.
- Suitable homework increases scores in quizzes, regular tests, standardized tests, and in any given exam.
- Suitable homework yields similar results to long length homework.
- Homework contributes to a large extent to study skills.

Analyzing the figure 4 and Figure 5 shows that in China students have the homework with the greater length and they have the best results. Too much homework yields great scores in standardized tests, but it produces too much stress and is long time consuming for students. On the other hand, Finland has the shortest homework and it approximates the students' performance on standardized tests to China. In Finland students spend approximately 4 hours on homework daily, while in China they spend approximately 14 hours. The evidence reveals the effect of quantity and quality produces similar results. The qualitative homework in Finland reaches similar results to the high quantity of homework in China. Qualitative homework in Finland approaches learning with respect to Optimal Homework.

Suitable homework does not have an exact placement or exact measurements in the value, but it approaches the best possible homework (homework related to exam sample questions) - Always exist a better homework than possible the best homework. Too much homework, or too little homework does not generate positive outcomes or it generates too much stress. The best homework approaches the average rate or golden ratio. Millennia ago, an unknown genius figured out that what would become known as the Golden Ratio was extraordinarily pleasing to the eye (thoughtCo.2, n.d.). On the other hand, average homework with content related to the sample example on a particular exam increases scores significantly. Also, homework contributes to study habits, respectively to study skills.

5. Summary

Homework was discovered by Roberto Nevilis (see Figure 9.) to improve students' learning outcomes. Nevertheless, there are opponents and proponents of the homework benefits. Based on the article, "Who Invented Homework: Top 5 Important Facts of Students", viewing homework from students perspective homework has bad sides such as: waste of time, additional burden, lack of motivation, extreme level of difficulties, stress and frequent episodes of anxiety. On the other hand, teachers as proponents of homework have their arguments of homework benefits. Teachers state homework benefits are as follows: better learning, Reinforcement Learning, deeper understanding, conceptual clarity, self motivation learning. The disagreement between the opponents and proponents of homework benefits shows differences at various ranks. There are some teachers, who do not support homework as a part of assignment; even researchers in education have some disagreement on the homework benefits. Based on this paper from the point of view of the literature review, it reveals the optimal homework might demystify some claims of homework opponents. For instance, homework opponents claim long homework causes stress to students and is time consuming. Suitable homework centers on spending average time and quality of homework relates closely to sample examples of any given exam. Suitable homework increments scores in any given assignment and improves learning outcomes tremendously and cuts the time spent on assignments.

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