Improving Homework Performance: A Closer Look at Homework Structure

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Abstract

This action research project investigated student performance in three types of homework assignments, across one third of all ninth grade students of World Geography. Ten assignments of varying length and difficulty were given to students and their homework completion rates were compared across assignments. Findings proved that students are more motivated to complete or attempt to complete easy homework assignments while they feel discouraged with difficult and interpretative assignments. Research also pointed that even homework has a learning curve and that, as they get more comfortable, more students will attempt even the difficult questions. This study hopes to answer questions in regards to homework design that will motivate maximum number of students especially minority students of lower socioeconomic status reflective of students that participated in this study.

Background/Introduction

In context of recent teacher professional development that suggested homework is necessary and essential for student success, a research project was devised to answer additional questions regarding homework as a tool of student success. Cooper, Robinson and Patall (2006) defined homework as any task assigned by schoolteachers intended for students to carry out during nonschool hours. They explicitly exclude a) in-school guided study; b) home study courses delivered through the mail, television, audio, videocassette, or the Internet; and c) extracurricular activities such as sports and participation in clubs as homework. To date, there is a large body of educational literature that pertains to a relationship between homework and student achievement. Research has established that homework has a positive effect on learning, particularly at the middle and secondary school levels (Xu, 2010; Zimmerman & Kitsantas, 2005). Overall, the effectiveness of homework is enhanced by providing students with choices among homework tasks, which will result in higher motivational and performance outcomes, students’ autonomy, and intrinsic motivation (Patall,
Cooper, & Wynn, 2010). While research has answered many of the questions in education, homework design is rarely touched upon and discussed.

In addition to professional development, new state educational requirements fueled campus improvement initiatives to better prepare students for the upcoming high school end of course exams. As part of this on-campus improvement initiative and in anticipation of the new Texas state testing standards, World Geography team at Willowridge High School decided to implement a weekly homework assignment for all 9th grade social studies students. Marzano and Pickering (2007) state that U.S. students spend much less time studying academic content than students in other countries do. Homework was seen as a way to counter that problem.

While the frequency of the assignments was readily agreed upon, discussions pertaining to homework design were left unresolved. The purpose of this article is to attempt to resolve issues regarding homework design, to take a closer look and attempt to find a design that will maximize student participation, concept retention and increase students’ in-class success.

Initially, the research was to focus on, investigate and measure student motivation and feelings they have toward homework but when campus needs were taken into consideration, study evolved to consider questions regarding homework design and structure. Further support for this shift occurred when, upon further review, established and recognized the limitations of most research by stating that although research has established the overall viability of homework as a tool to enhance student achievement, for the most part the research does not provide recommendations that are specific enough to help busy practitioners (Marzano, 2007).

The purpose of this research then became identification of an ideal length and difficulty of homework assignments in order to maximize student learning, increase student motivation and capture highest number of students without sacrificing instructional quality. Furthermore, this research sought to find a good combination of length and difficulty for homework assignments in order to maximize retention and student participation. For the measure of homework difficulty,
Bloom’s taxonomy levels were used as a reference point. Homework was designed to include easy assignments that are considered to be at the Knowledge level, or lowest level, of Bloom’s taxonomy. Next step in the homework assignments added to this level and required students to build on Knowledge by completing questions that deal with other, more difficult, levels of Bloom’s taxonomy such as Comprehension, Application, Synthesis and Evaluation (Bloom, 1956).

Presently, there are many options and approaches in creating and structuring classroom activities and homework aiming to improve the learning process. As the process is discovered, it undergoes constant changes as teachers attempt to increase motivation and involve the highest number of students. This study hopes to aid teachers as they continue to refine the educational processes and to inform them of the types of homework assignments that will ensure better student learning. Furthermore, this research will examine student motivation and performance when faced with tasks that vary in length and difficulty. The research will span a period of ten weeks which corresponds with one grading period where a variety of homework assignments will be given to the students and their participation will be measured. This study will examine student willingness to complete these homework assignments and will be guided by the following questions:

1. What is the performance difference between long and short assignments?
2. What is the performance difference between easy (knowledge) and difficult (evaluate and analyze) assignments?
3. How will students complete assignments with increasing difficulty? Will the students complete only the easy section?
4. Will students complete homework assignments if only the difficult questions are given?

Research on Homework

To better understand research needs, a large volume of literature that pertains to homework was reviewed and evaluated. Current research on homework can be grouped into several categories:
1) perceptions about homework; 2) purpose and benefits of homework; and 3) generalized homework structure.

A study by Eunsook, Min and Yun, (2011) compares student perceptions of homework to those of teachers for Math and English. According to this article, many students, especially older students, perceive homework assignments as having little intrinsic or utility value but a good proportion of middle and high school students do think that homework is necessary and that it helps them develop academic skills and increase achievement. Furthermore, this article touches upon student motivation and it states that studies have shown that students’ motivation to complete homework differs in varying degrees across various subjects. For instance, students spend more time and effort on math homework than English homework. (Eunsook et al, 2011). This study fails to examine the question of difficulty in homework assignments between the two subjects where mathematics homework could be on a level of knowledge and comprehension while English homework might require higher levels of critical thinking and is therefore less likely to be completed. Another inadequacy of this study is that it did not elaborate as to the types of homework questions asked in math and English, if these questions were direct or ambiguous and which subject tends to have more of one or the other type. The question of homework simplicity is aligned with the present study as it hopes to differentiate student performance in relation to direct or knowledge based types of questions in Bloom’s taxonomy. In the study, student motivation and ability to complete all types of questions is measured and evaluated.

Student point of view was considered as a way to identify variables that may influence perceived purpose for doing homework. According to Xu (2010), these variables have included student and family characteristics, family homework help, teacher feedback, and homework interest. Each of these variables affected homework participation and benefits. This study helps make one aware that there are numerous variables at play and no one thing can be scrutinized in isolation, however, it could be possible to overcome some of these limitations by adequately planning and
structuring homework assignments. A study by Cooper and colleagues' (2006) was concerned with a comparison of homework with no homework and the results have indicated that the average student in a class in which appropriate homework was assigned would score 23 percentile points higher on tests of the knowledge addressed in that class. Additionally, in the article by Bempechat, Li, Neier, Gillis, and Holloway (2011), 92 high and low-achieving ninth graders from low socioeconomic backgrounds were individually interviewed and differentiated between high achievers and low achievers (2011). High achievers had well developed self regulatory skills while the low achievers were non compliant and disengaged. The study concluded that students differed in how they expressed their commitment to their work.

Regarding homework structure, several studies suggested general framework and provided some guidelines on length, difficulty and structure. According to Marzano, previous research raises several possibilities for homework design, but no specific formula was provided for teachers (2007). Cathy Vatterott states that there are five fundamental hallmarks of good homework and these are: purpose, efficiency, ownership, competence, aesthetic appeal (Vatterott, 2010). While this article proposes the five building blocks of a good homework assignment, it does not provide a specific homework formula this research project hopes to accomplish. Furthermore, Marzano proposes to design homework to maximize the chances that students will complete it, but fails to provide further details beyond this statement (Marzano, 2007). Cooper suggested that research findings support the common "10-minute rule" (Cooper, 2007, p. 92), which states that all daily homework assignments combined should take about as long to complete as 10 minutes multiplied by the students grade level. He added that when required reading is included as a type of homework, the 10-minute rule might be increased to 15 minutes. Though useful, this study only details amount of time students should spend doing homework but not whether it should be time spent on one difficult assignment or several easy assignments.
Overall, research in regards to homework is as widespread and varied as are the questions posed in attempts to understand levels of benefit derived from homework and to raise awareness of the drawbacks inherent in perceptions we hold about homework. A number of homework researchers took the perspective that homework is beneficial and built on this by focusing on creation of simple guidelines for teachers to be used when they plan and create homework assignments. This research project hopes to build on these general guidelines and provide teachers with a more specific framework they can successfully use.

Methodology

Setting

Willowridge High School is a suburban school in the Greater Houston area with a student enrollment of 1484 in 2010. According to National Center for Education Statistics (NCES) and Common Core of Data (CCD) Public school data 2008-2009 school year, 62% of students are African American, 37% are Hispanic and 1% of students are other. Furthermore, 66% of students are economically disadvantaged, approximately 4% are gifted and talented and 13% receive special education services. As of 2010, Willowridge High School is recognized school by the TEA based on the state test performance.

Participants

All student involved in this project are in a 9th grade social studies class – World Geography at Willowridge High School. There were 421 students taking World Geography in 2010-2011 school year and approximately one third of these students participated in the study. During a ten week grading period, six classes and a total of 142 students were observed and their homework performance was recorded. All of the students in the study had the same teacher, and were engaged in similar learning activities. All students received their homework assignments in advance at the
beginning of the grading period and had the option to submit all the assignments early or to submit one assignment per week.

**Materials**

Students were able to use a variety of sources to complete these homework assignments. Textbook was their primary means of information but they were urged to use dictionaries, encyclopedias and the Internet as secondary sources of information and to help them with critical thinking questions.

**Procedures**

Homework assignments were graded for accuracy and completion. A total of ten homework assignments was issued to students in the first week of the study. One assignment was due every Friday, with allowances made for late work submitted.

Seven out of ten of these assignments were two tiered and included knowledge and either comprehension or application of vocabulary covered in the weekly lessons. For example, Homework Two required students to define 12 geography terms (tier 1-knowledge) and to write a newspaper article using these words (tier 2 – application). Of these seven assignments, two were considered “short” where the number of terms to define was around five, while the other five assignments were considered “long” where there were twelve or more terms to define. Three assignments were not two-tiered but were considered “difficult” since they dealt with higher levels in Bloom’s taxonomy only. These three assignments gave students flexibility to choose from two options but both options would be considered challenging by the students because they would be unable to find direct quotations from the text to help them complete these assignments but would have to pull information from a variety of sources and apply critical thinking skills to meaningfully complete the assignment. They could choose between synthesis and evaluation type questions for Homework Five, analysis and evaluation for Homework Seven and synthesis and analysis for Homework Ten.
# Table 1: Homework Structure

<table>
<thead>
<tr>
<th>Homework Assignment</th>
<th>No. of Terms to Define</th>
<th>Additional Questions (level of Bloom's taxonomy)</th>
<th>Examples of Additional Questions</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>5</td>
<td>Comprehension</td>
<td>draw pictures of the terms</td>
</tr>
<tr>
<td>2</td>
<td>12</td>
<td>Application</td>
<td>write a newspaper article using the terms</td>
</tr>
<tr>
<td>3</td>
<td>6</td>
<td>Application</td>
<td>write a 5 question quiz from the terms</td>
</tr>
<tr>
<td>4</td>
<td>12</td>
<td>Application</td>
<td>write a journal (diary) entry using the terms</td>
</tr>
<tr>
<td>5</td>
<td>N/A</td>
<td>Synthesis or Evaluation</td>
<td>write a newspaper article about culture in Africa OR research and write a case study about an African city</td>
</tr>
<tr>
<td>6</td>
<td>12</td>
<td>Comprehension</td>
<td>draw pictures of the terms</td>
</tr>
<tr>
<td>7</td>
<td>N/A</td>
<td>Analysis or Evaluation</td>
<td>write an analysis paper (effects of physical geography on population patterns) OR write an opinion article for or against preservation of land in Africa</td>
</tr>
<tr>
<td>8</td>
<td>13</td>
<td>Application</td>
<td>write a newspaper article using the terms</td>
</tr>
<tr>
<td>9</td>
<td>13</td>
<td>Comprehension</td>
<td>draw pictures of the terms</td>
</tr>
<tr>
<td>10</td>
<td>N/A</td>
<td>Synthesis or Analysis</td>
<td>write a letter describing your travels through Asia, use the 5 senses (taste, touch, smell, hear, see) OR write an analysis paper of life in Asia including benefits and drawbacks.</td>
</tr>
</tbody>
</table>

**Data Sources**

Over the course of ten weeks, the number of homework that was returned was tracked for the students in the study. The three types of results were recorded. First, the number of homework attempted or completed was recorded for all the students. Second, the number of students that attempted or completed both tiers of questions for homework assignments that were twotiered (Homework 1, 2, 3, 4, 6, 8 & 9) was recorded. Third, the number of students that attempted or have completed the difficult homework assignments were tracked (Homework 5, 7 & 10).
Analysis and Findings

First research question required a closer look at a difference in student performance between long and short assignments. For the 142 students that participated in the study, average attempted completion rate was measured across all short and compared to averages of all long assignments. The expectation was that more students will complete short assignments and that the average of attempted completion for these types of assignments will be greater. The results followed this expectation since the average completion rate across all the long assignments was 67.4% and the average completion rate from the two short assignments was 73%. The results indicate a preference for short assignments but the difference in preference is not as large as initially perceived; only about 6% of students lost their motivation to complete homework that was twice as long.

Second research question stipulated that there will be a difference in performance between easy and difficult questions. For this question, homework centered on understanding and defining vocabulary was compared to homework that required critical thinking and a great deal of research and writing. As expected, easy homework had more student participants but the magnitude of difference yielded further insights. Average completion rate of the difficult assignments was 47.7% and represented the least successful area for the students. When comparing the difficult assignments to the short, two tiered assignments, over one quarter of students either lost motivation to attempt the assignment or had inadequate skills and abilities necessary for these difficult assignments.

Third research question focused on finding out, in two-tiered homework assignments, if the students will complete both the easy and the progressively more difficult questions or if they will stop once they reach the difficult sections. Table 2 demonstrates the percentage of homework completion by homework assignment for all 142 students as well as percentages of students that completed the difficult second tier section of the select assignments. For example, 142 students were
given homework 4 assignment, 68% or 97 student completed or attempted to complete this homework assignment while only 6% or 9 students overall completed the difficult second tier section of this homework. Results did not deviate from the expected in that more students completed or attempted the homework they perceived to be easier with some difference in completion between long assignments and short assignments. The results, however, are very troubling when looking at the percentage of students that attempt the second tier, a percentage which hovered between 4 and 11%.

Table 2: Results

<table>
<thead>
<tr>
<th>Hmwk Assignment</th>
<th>Short Assignment Description</th>
<th>% of all students that completed or attempted homework</th>
<th>Number of Students out of 142</th>
<th>% of all students that completed the second tier</th>
<th>Number of Students out of 142</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>two-tiered, short</td>
<td>73%</td>
<td>104</td>
<td>11%</td>
<td>16</td>
</tr>
<tr>
<td>2</td>
<td>two-tiered, long</td>
<td>63%</td>
<td>89</td>
<td>4%</td>
<td>6</td>
</tr>
<tr>
<td>3</td>
<td>two-tiered, short</td>
<td>73%</td>
<td>104</td>
<td>5%</td>
<td>7</td>
</tr>
<tr>
<td>4</td>
<td>two-tiered, long</td>
<td>68%</td>
<td>97</td>
<td>6%</td>
<td>9</td>
</tr>
<tr>
<td>5</td>
<td>difficult</td>
<td>39%</td>
<td>55</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>two-tiered, long</td>
<td>68%</td>
<td>97</td>
<td>11%</td>
<td>16</td>
</tr>
<tr>
<td>7</td>
<td>difficult</td>
<td>46%</td>
<td>65</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>two-tiered, long</td>
<td>73%</td>
<td>104</td>
<td>11%</td>
<td>16</td>
</tr>
<tr>
<td>9</td>
<td>two-tiered, long</td>
<td>65%</td>
<td>92</td>
<td>25%</td>
<td>36</td>
</tr>
<tr>
<td>10</td>
<td>difficult</td>
<td>58%</td>
<td>82</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Final research question focused its attention on only the difficult assignments and how will students respond to these types of questions. Three assignments that did not give students the option of defining the vocabulary, but instead asked the students to evaluate, analyze or synthesize
knowledge learned in class and apply it to other situations. As stated before, this type of homework is the least successful in terms of percentage of student participation. For these types of assignments, first one 39% of student attempted to complete, second 46% and third and last 58%. In terms of progression, for both the long and short assignments there was no discernable pattern in percentage completion when comparing first to last assignment, however, there was a significant upward trend that occurred in completion of the difficult assignments as shown on graph 1.

Graph 1: Difficult Assignments-Progression

**Discussion**

In conjunction with past research, this study hopes to achieve the aim of creating an actual framework for homework assignments. Results indicate that length is not as big of an issue for students as the perceived difficulty of the assignments. In particular for assignments in social studies, a homework assignment will positively impact around \( \frac{3}{4} \) of student population and \( \frac{1}{4} \) will not complete any given homework assignment and will therefore not reap the benefit of knowledge retention. Overall body of research suggests external factors such as home situation, socioeconomic
status, parental involvement and existence of home study space will have a significant influence over students’ willingness and ability to complete homework assignments. Additionally, intrinsic factors such as self motivation, ability to focus, comprehension of the material as well as knowledge and skills to complete assignment will add or take away from students’ motivation and willingness to complete homework assignments. This research takes extrinsic factors as is, and is aware that most students at Willowridge High School are perceived to have one or more disadvantages of extrinsic nature and hopes, by carefully designing homework assignments, to overcome the intrinsic disadvantages students may face to offset the disadvantages students face at home. This study shows that homework structure where all students feel they can complete some or all parts of homework will, as a general rule, be more successful than homework that requires only the higher level thinking processes. Furthermore, keeping in mind the “10 minute rule” most students were expected to complete the short homework in 20 minutes or less and long homework in 40 minutes or less while the difficult assignments could take up to 60 minutes or more due to the nature of extensive research that was required. One can draw a parallel between this study and study completed by Eunsook et al (2011) which states students are more likely to complete math homework than the English homework. Reasons for the difference may be accounted for in the difficulty and ambiguity of the assignments between these two subjects. Though the research of Eunsook et al (2011) does not specifically state it, in general math homework tends to center on assignments that are designed with a goal of repetition and practice while English homework, on the other hand, requires reading, evaluating, analyzing and writing with little or no repetition. Keeping this general framework in mind, math homework would be focused on knowledge and comprehension levels of Bloom’s taxonomy, while English homework would have tendencies to ask students to perform analysis and evaluation of reading material, both high levels of Bloom’s taxonomy. This difference alone, when taken with present homework research, could explain why the homework participation is higher in math then in English. Furthermore, as we move through the levels of Bloom’s taxonomy, the
ambiguity of questions increases therefore the easier assignments have a more straightforward instructions attached to them, while the difficult assignment have instructions that are interpretative and ambiguous. Present study shows that students prefer easy and straightforward questions and when they get to the more difficult and ambiguous assignments, few students attempt to complete them because they might feel a sense of discouragement or may lack the skills necessary to complete these types of assignments. Moreover, present research has shown that though discouraged with difficult assignments, consistency can help overcome this sense of discouragement. As students become more comfortable with homework expectations, they also become more alert to feedback regarding the difficult assignments and more receptive to teacher instruction designed to help them complete these difficult assignments. Consistency, feedback and continuous instruction may be the tools for teachers to use in order to help students overcome the intrinsic blocks that may inhibit their homework participation. The results of this study have shown that teachers, using the tools above, could expect students to attempt difficult homework as they move along the learning curve.

**Reflections/Action Plan**

In conclusion, this research project answered questions of homework difficulty and how the difficulty relates to student participation and motivation. In the future, the social studies department will pay closer attention to homework design and difficulty when creating homework assignments. Listed below are insights gained from this study and steps to be considered during the planning of the homework assignments. First, a habit of completing homework assignments should be created, and this is best done by assigning homework on specific day or days of the week, every week. Second, students should get comfortable with their abilities to complete homework and should receive instruction and feedback for the more difficult parts, therefore several homework assignments in the beginning should not be graded too strictly. Third, teachers should allow for difference in student abilities, and for uneven learning curve as some students learn faster than others and in such case,
two or three tiered assignments can be given to give all students a sense of accomplishment and challenge. The more advanced students can complete all tiers and continue to develop their critical thinking skills while the less advanced students can participate on the knowledge and comprehension levels with the hope they too will eventually move to the next level. Fourth, at intervals, take all the students out of the comfort zone and assign difficult questions. Provide instruction and feedback before and after these types of homework are assigned and are due. This would serve as a way to force some students to perform at the next level of Bloom’s taxonomy. Initially, this type of homework will not be successful and teachers should be mindful of how many times and when to assign them, expectation is that more students will participate on difficult assignments each successive time and this type of homework will, indirectly, reflect on the multi-tiered homework as more students will develop abilities or motivation to complete the difficult parts. Homework design is a tradeoff between student participation and student learning and because of this homework should be progressive in learning, should challenge all students and incrementally increase the difficulty in hopes that if done gradually student participation will not decrease. As stated above teachers should first develop habits, get students to buy into the homework idea, challenge all students at their levels of skills and knowledge, enable students to reach for the next level and provide continuous feedback. Carefully designed assignments can help guide students as they acquire better understanding of the subject and provide a way to practice the critical thinking skills that are transferrable to all subjects.
References


