**Do Apps Increase Student Productivity?**

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**Abstract**

There are many mobile apps classified as productivity apps, however studies that determine the impact of these apps on the user’s productivity haven’t been conducted. This study focused on student productivity because most students are surrounded by technology in and out of classrooms in today’s world. The question that guided this study was; do apps increase student productivity? The hypothesis was that the use of the app myHomework would increase productivity in high school students. Students from the local Westchester high school volunteered to participate in the study and were in all grade levels. The students took a baseline survey before the study began and then they proceeded to use the app “myHomework” for one month. At the end of the 1-month period the students took an end of study survey to conclude their participation. The results of this study monitored if the student was less or more productive after using the app, and tracked how stressed students found themselves before using the app and after using the app. These results determined if using productivity apps was beneficial to students, but there was not enough data to make my findings statistically significant, and thus my hypothesis that apps increase student productivity was not supported. Future studies can compare different apps as well as use larger sample sizes and volunteers from different age groups.

**Introduction**

Students in the 21st century find themselves surrounded by technology almost all of the time. Data from a study in 2004 says that 58% of students in grades 6-12 have a cell phone and that 68% of those students bring their phones to school (Obringer, 2007). Also, in 2001 a report by the National Center for Education Statistics (NCES) found that 99% of public schools had internet access. (Kleiner, 2002) With this information, and the furthering of technological advancements in the last decade it’s safe to say that high school students can’t escape the reality of the role technology plays in education during the 21st century. Productivity apps that can be found on mobile devices and tablets serve many purposes such as planning and keeping track of events and due dates. It is important to study how apps increase productivity among students because given that they’re surrounded by technology, students should be able to know if these apps can benefit their education and productivity.

Past studies haven’t focused with how apps increase student productivity, but when researching this topic, a study I found from 2019 compared two types of apps, one of which was mobile and compared the effectiveness in fleet management. (Levi-Bliech, Michal, et al., 2019) While this study didn’t address student productivity it did demonstrate how mobile apps can create efficiency in a professional setting. Another study evaluated different software engineering processes that help companies create apps. (RonaldJabangwea, and Anh NguyenDucc., 2018) This study provides useful information about different systems that can be used when creating an app, but its results are meant to guide business decisions. Lastly, another study developed 10 criteria to help students and educators determine how useful the app they’re using is. (Jonas-Dwyer, Diana Renee D, et al., 2012). These criteria are relevant because the students will be evaluating how the app impacts their own productivity and it’s important that they know what to look for and evaluate. However, it’s also important to address that these journal articles don’t directly address the use of productivity apps as they pertain to student productivity because there are no papers that discuss this topic. These are the most relevant papers that I could find on productivity as it relates to mobile applications, and this demonstrates the need for more research in this area.

Productivity is the measure of efficiency of tasks being completed. Productivity is expressed in ratios of input to output of whatever task needs to be completed in the designated time frame. For this study, measuring productivity will consist of tracking the relationship between the time using the app and the amount of homework completed. The intended result is that using the app myHomework will increase the amount of homework completed. The student will have taken a baseline survey before the testing period and will retake the same baseline after the testing period is over. The results will be compared and analyzed for correlation between use of the app and how much homework students complete. This study has never been done before and will specifically target both students and productivity apps. This study aims to start bridging the gap between studies that deal with mobile apps as they relate to productivity/efficiency, and studies that deal with high school students and how they’re effected by the technology around them. I hypothesize that the use of myHomework will increase productivity in high school students.

**Methodology**

Participants in this study were volunteers from a local high school ranging from grades 9-12. Participants under the age of 18 acquired parent/guardian consent and filled out the Human Informed Consent Form. All consent forms were sent or given to the high school science research teacher and participants were assigned identification numbers before any surveys were sent or completed. Both surveys did not ask for a name, but they did ask for the assigned identification number. Additionally, this is a low-risk study and participants were not asked for any personal information regarding age, race, sex, religion, sexuality, ethnicity, citizenship, or gender identity.

***Baseline Survey***

The baseline survey asks a multitude of questions from course load and class difficulty to extra-curricular activities, social media use, and studying habits. Course load and class difficulty are measured in the amount of regents/state level classes, honors classes, or AP classes a student takes. Participants are asked to list any extracurricular activities or jobs they participate in and estimate the amount of time (in hours) that they spend on these activities/jobs every week. Participants are also asked to estimate the amount of time (in hours) they spend on social media daily. Studying habits are questioned through the number of breaks students take while doing homework on a daily basis, and the amount that students reach out to their peers about class related topics on a weekly basis. Additionally, this survey asks about homework completion and stress levels. Stress levels are based on an average school week and chosen from a scale of 1 to 10, with 10 being the most stressed. The same homework completion question is on both surveys, and it’s stated like so; “On an average school day, how much homework do you complete?” There are 5 answers to choose from: 0% = none, 25% = a little bit, 50% = about half, 75% = most, 100% = all.

***End of Study Survey***

The end of study survey is conducted approximately 28 days after the baseline survey is taken, and it asks the same questions about course load, class difficulty, extracurriculars, social media, studying habits, stress, and homework completion, but it also asks about the use of the app myHomework. After inquiring about the amount of homework completed on an average school day, this survey asks; “On average, how often did you use myHomework?” The answers to choose from are: barely used it, 1-3 times per week, 4-6 times per week, or every day. After this, participants were asked how long they used the app for each time they used it. The choices for this question are: less than 10 minutes, 10-20 minutes, 20-30 minutes, or more than 30 minutes. The last 2 questions are related. The first of the two questions has the options of either yes or no, and it asks if the participant enabled notifications for myHomework. The second question follows up and asks if the participant found the notifications useful (if enabled). The three choices for this question were: yes, no, or I did not enable notifications. Lastly on this survey, there is an optional space for any comment or feedback that the participant has.

**Results and Data**

Figure 1 represents the correlation between the amount of time the app myHomework was used and the amount of homework completed. On average, people who used myHomework every day completed 83% of homework, students that used myHomework 4-6 times per week completed 87.5% of their homework and students that only used the app 1-3 times per week completed 62.5% of their homework. The students instructed not to use myHomework completed 75% of their homework, which reveals that without using myHomework, homework completion did not increase or decrease. Students that used myHomework everyday or 4-6 times per week saw an increase in homework completion whereas students that only used the app 1-3 times per week saw a decrease in homework completion. However, using the correlation coefficient formula, the r value was determined NaN (not a number) which indicates no correlation. A significance value could not be set, and a p-value was not determined. The data is not statistically significant and does not support my hypothesis.

Figure 1: ‘Average HW Completed’ by ’Time using the app”

Figures 2 and 3 display the average stress levels for participants. Figure 2 displays the stress levels of the experimental group. Before using the app myHomework, students reported an average stress level of 6.7. After using the app and answering the end of study survey, students reported an average stress level of 5.4. Similarly, figure 3 displays the stress averages of participants before and after the one-month study period, but figure 3 represents control group participants. Students in the control group did not use myHomework and reported an average stress level of 8 before and after the one-month study period. This does not show a direct causation between using myHomework and decreased stress, but it alludes to a correlation because average stress of participants that used the app decreased while average stress of participants that did not use the app stated the same.

Figure 2: Experimental Group Stress Averages Figure 3: Control Group Stress Averages

**Analysis and Conclusions**

There is not enough data to make my findings statistically significant, and thus my hypothesis that apps increase student productivity cannot be supported.

***Follow up questions***

6/7 of the participants that used myHomework said they enabled notifications, and of those participants, all of them said that they found the notifications to be helpful. Additionally, the one participant that did not enable notifications left a comment in the optional space at the bottom of the end of study survey and said “I liked it. I never forgot about assignments, and it helped keep me organized.”

***Limitations***

The limitations of this study stem from the sample size. Having 9 participants is not enough to determine the effect of apps on student productivity. Additionally, students from only one town, in one county, in one state, and even in one country, is too narrow of a selection. A future study should seek out more students on a statewide level, national level, or even international level. Future studies should also test older age groups like university students, or even younger age groups like middle school students.

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