

**Investigating School Related Software
Applications' Effects on Academic Magnet
High School Students' Performance**

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On my honor as a University Student, I have neither given nor received
Unauthorized aid on this assignment as defined by the Honor Guidelines
For Thesis-Related Assignments

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Introduction

How do school related software applications affect Academic Magnet High School students' performance? Throughout the world students struggle with school. Approximately 1 out of 4 high school seniors in America will not graduate high school (11 Facts About High School Dropout Rates, n.d.). A kid's ability to succeed at school is extremely important in preparing them for the rest of their life. Today's students face psychological factors unknown to previous generations. Currently 90% of teens ages 13-17 participate in at least 1 form of social media (Kamenetz, 2019 & 2018). It is important that middle and high school students have positive influences around them from the people they interact with to the applications on their phone. Therefore in my research I will be investigating how social media affects adolescent students. Additionally, I will determine a list of social media features that have positive effects in order to complete my technical project's design. As a computer science student and aspiring entrepreneur, I'm interested in designing and creating software applications that do good in the world.

STS Framework

To begin applying median theory, it's helpful to define the relationship between the technology and humans. First, to be clear about what technology and humans are involved, the technology includes any software that a school or teacher requires or encourages students to use, and the humans consist of students, teachers, and school administrators. There are two types of human-technology relationships present, embodiment and alterity. In embodiment relationships, humans use technology to interact with the world. Students use Collab or Edmodo to interact and communicate with their teachers or peers. In alterity relationships, humans interact with

technology, and the world is in the background. Students use Collab to view resources and use Kahoot to answer questions.

Now that the relationship between the technology and humans has been better defined, the mediated values can be examined. The first value to discuss is equity. Since the technology at hand requires secondary technology to access, an application requires a phone or computer to use, students who have less access to phones or computers may be at a disadvantage. This is likely to affect students in lower income families who may not always have internet access or a computer to use the school's required software. The interpretation is that it's the school's responsibility to ensure that no students are unfairly disadvantaged. Finally the action is using the applications.

The second mediated value to consider is the relationship and power dynamic between students, teachers, and administrators that the applications have now become a part of. Relationships used to only involve humans, but this new type of relationship that includes technology as well is the heart of mediation theory. Students have always been at a power disadvantage to teachers. Will this technology grant some power to students by allowing for more fairness and protection by keeping more digital records of events? Additionally more lines of communication to administrators or other students are available with this technology which could allow students to ensure honesty. This is not to say that teachers are taking advantage of students often, nonetheless the power dynamic may be shifting. The interpretation is the ideal type of student teacher relationship, and the action again is the use of the applications.

Lastly it is important to acknowledge the engineer's and designer's role and responsibility from the perspective of technological mediation. Since we now consider technology to not just be a tool but to affect human behavior and the interactions we have with

the world around us, engineers must contemplate in what ways they are affecting users. In the case of my study, engineers have a responsibility to make non-addictive school applications that do not prey on students' psychology and cause them to want to continually use the app.

Engineers should create apps that're honest and transparent and do not benefit some kids more than others. In conclusion it is important for engineers to realize that they are not simply adding features to software but rather affecting human behavior which could ultimately have tremendous results.

Research Method

In order to determine how school related software applications affect Academic Magnet High School students' performance, I will first determine the performance level of the school by examining publicly available data. Next I will interview two teachers, an english teacher and a computer science teacher, to discover what software applications they use. Additionally the teachers will be asked for their perspective on the effects of the applications on students.

Data Analysis

Since the methods of this study have shifted from an examination of software applications and literature to a case of study of Academic Magnet High School (AMHS), let's establish the context around these high school's students' performance. According to AMHS's South Carolina school report card, the students' academic achievement is excellent. This is supported citing 100% and 98.2% of students receiving a C or higher on the end of course english and algebra exams respectively. The next important data point is AMHS's graduation rate which is 100%. Finally 100% of students are college ready as reported by South Carolina because all students received a 3 or higher on at least 1 AP exam. These three performance indicators reveal that students at AMHS are performing well.

To investigate the effects school related software was having on students' performance, learning, and social dynamics, interviews with teachers at AMHS were conducted. The first interview was with an English teacher who uses the software applications zoom, canvas, kahoot, padlet, and flipgrid on an at least once a month basis. She believes students may benefit from using padlet because it increases participation by allowing students to comment on each others' responses. She also requires that students view other students' posts on padlet which helps them understand the depth of analysis they are posting compared to others and see others' ideas. She says this may motivate students. A few other benefits she has experienced from these applications are variety, by offering a new class activity, and immediacy, by padlet showing responses and comments right away. While she voluntarily chooses to use flipgrid and padlet, they do have their drawbacks. Students were goofing off and crashed padlet by spamming the same word over and over as a comment. Additionally, too much screen time and ensuring technology use didn't disadvantage certain students, who may not have internet access for example, were two more of her concerns.

The second teacher interviewed, Mr. Schmitt, uses the applications code.org, projectleadtheway (pltw), and canvas. He likes code.org because it has useful widgets that provide a great introduction to basic principles of coding, pltw because it gives access to a virtual machine which means that students can practice hacking ethically, and canvas because it helps student teacher communication. His advanced placement computer science principles and introduction to cybersecurity class courseworks are based almost entirely around code.org and pltw respectively. He thinks relying on the software in this way is good and bad. Good because it places the learning in the students' hands which means they can move at their own pace. He spends little time lecturing, instead it's up to the students to take charge of the material by

moving through the modules provided by code.org and pltw. Bad because both software applications have their flaws. Code.org can seem elementary to some students which can make them bored, and pltw isn't customizable so he doesn't have any control. Ultimately he's satisfied with the canvas software applications because it is feature rich.

Conclusion

School related software applications serve a wide variety of purposes. Some break up a potentially monotonous lecture with engaging activities such as padlet and flipgrid. Others supply and facilitate the coursework that drives an entire class such as code.org and pltw. Finally a third group, canvas, supports administration and teacher student communication. AMHS students are performing extremely well in school, so how much credit can we give to these applications?

While technology can often be seen as a distraction, software applications can also help students who have trouble sitting still and listening become interested. Flipgrid and padlet encourage active participation with posts, videos, view counts, and comments which is critical to learning according to AMHS teachers. Additionally these apps expose students to their peers' viewpoints by making the posts, videos, and comments public which expands their perspective and generates self awareness. In contrast to these activity apps, coursework applications do not provide a break from lectures but rather replace the lectures themselves. Code.org and pltw let students learn as quickly or slowly as they like, with respect to deadlines, by giving them the course's information on a webpage and not from the teacher's mouth. This fixes the pacing issues of a typical class.

Teachers clearly believe these apps have a net positive effect, however it is important to note the apps' drawbacks. Firstly, school administrators should ensure certain students are not

disadvantaged by a class's technology use. This means providing students ample internet access and time with a computer. Next, as for the apps themselves, padlet and flipgrid provide a platform for students to goof off and "troll". While it is natural for students to misbehave at times, it can take away valuable teaching time. As suggested by Mrs. Lankford, stronger controls for the teacher could help deal with this problem. In regards to code.org and pltw, they are large scale software projects that teachers do not have much influence over. Students can be bored by code.org's simplicity and pltw's step by step instruction manual so having the ability to take note of these issues and make changes would be beneficial.

The landscape of schools is forever shifting. Understanding how the latest actors, in this case software applications, are changing education is incredibly important to provide the best opportunities for the next generation's students. By interviewing teachers and considering their perspective, a first hand account of the effects of these applications was gained. These apps appear to provide a number of benefits but also have their own deficiencies. Improving the next iteration of applications can put the next students in a prime position to succeed.

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