How the Interruptions of Social Media affect Teen's Study Habits and Anxiety Levels Associated with School

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1. Introduction

In recent years, a social media app has taken over the nation; Tik Tok has become the most popular social media due to its shortened videos that engage users who are primarily adolescents. This app creates a customized algorithm that appeals to the videos the user has liked in the past making the app more enticing, giving the short bursts of serotonin shortening attention spans. A trend recently became popular on Tik Tok that was referred to as *devious licks,* which is where people would take an item from their school home without teachers knowing and create a video. This became problematic due to the blatant destruction of property but also, "students would struggle to interpret situations they encountered stemming from social media. When students were in the office with these issues, they were not in the classroom with the teachers and their peers learning and interacting with content," (O'Brien et al.). With trends like this social media is taking over and taking up valuable time that can be used for studying and instructional time.

Social Media, websites or applications where users can create or share content who participate in social networking, has become more prevalent in the world due to the rapid growth of technology (Korda et al.). "Typically, college students unlock their phone 50 times a day using them for close to 4 ½ hours out of every 24 hour cycle," which is around every 15 minutes for the whole day (Rosen 1). The introduction of the internet sped up the diffusion of these technologies and social media platforms furthered the spread of information. With the widespread use of social media, adolescents are starting to be on it regularly creating a habit. With these new habits being created, teenagers are becoming attached to both their phones but also their presence on social media creating an anxious feeling when without it. Teens are becoming reliant on social media to express their feelings, interests, and other activities which are getting in the way of their school work. "The average adolescent or young adults find it difficult to study for 15 minutes at a time; when forced to do so, they will spend at least five of those minutes in a state of distraction," which makes the study time not as productive or takes longer to retain the same amount of information (Rosen 1). This distracted state is where many people struggle with their attention span nowadays. In classrooms now teenagers are under constant stress due to their load of homework, a contributor to this is their use of social media because they feel that they have to have a continuous appearance on social media to be relevant in their social circles. This need to fit in takes over a teenager's mind due to the fact that they cognitively believe that social relationships are the most important thing in their lives at this time. This ideology of teenagers has been observed by many psychologists including Erik Erikson who created psychosocial stages that would have a crisis that needed to be resolved during certain ages of life. Adolescents are in the stage where their main task is to develop their sense of themselves which nowadays is mostly on social media. This need to find themselves on social media creates distractions in their studies causing them to be behind and taking more time than needed. My research makes an understanding of how these distractions affect Advanced Placement adolescents' study habits and their anxiety levels with academic curriculum in Central Texas highschools.

2. Literature Review

2.1 Effects from Development

The adoption of the use of social media in adolescents results in a shift in teenagers' study habits with their advanced placement and anxiety stages that come with it. This shift is due to algorithms found in apps that shorten attention spans causing adolescents to be the main victim. This led to adolescents depending on their phones at all times during the day. A peer reviewed case study, performed by Nancy Cheever, was conducted by taking students' phones from them and telling them to do nothing for an hour and the researchers would check up on them and ask how anxious they felt. The ones who had the

lowest smartphone usage reported to have low levels of anxiety while the ones who had high phone usage, mostly young adults or teenagers, reported to have high levels of anxiety. These types of emotions impact adolescents more than older individuals due to their brain development. The prefrontal cortex is the part of the brain that regulates actions, emotions, and thoughts, which is only fully developed when an individual is twenty-five years of age. Without this cortex being fully developed adolescents are more susceptible to rash decisions that can impact their everyday lives including their education. Another big part of how anxiety is developed is in the amygdala which is responsible for expressing aggression and fear. These parts of the brain send signals to each other and affect the individual. Although this study focuses on just taking up a smartphone and not the interruption of social media unlike my own methods, it still shows that students have a connection with their devices for a reason and in most cases it is their social media activity causing them to get attached. This connection is on the same level as the dogs in Pavlov's experiment and the bell that would be rung each time they would get fed which eventually classically conditioned them into salivating everything the bell went off. Teenagers are the same with their cell phones because when they get a notification they instinctively check their phone without thinking.

Another peer reviewed case,by Leah Somerville, had an incident where an individual tripped across a school stage and was embarrassed. This example illustrates how certain events can show how social evaluation can be extremely emotionally challenging for adolescents. Adolescents group their social standing and emotions together. With this student tripping on stage their peers started to call them names which included *awkward* and this made the individuals emotions with the event turn negative (Somerville 121). Even though it was bad social standing for this student they were relevant. This shows that adolescents carry big feelings with their social standing which is becoming more prevalent in social media due to technological advances. Even though this case didn't explicitly include the use of social media for the incident to be spread in this modern decade many turn to social media to share what happened to them during the day or what celebrities did, making the incidents spread a lot faster.

2.2 Social Media Studies

Taking into account the widespread use of social media, teens have started creating trends and other information that spread through social media. This creates a need for being on social media multiple times a day and for a long period of time which then interferes with other tasks the teens need to complete including studying for school. A peer reviewed case study, performed by Laura Bowman and her colleagues, was conducted to "assess the effect of interrupting students while they studied" by splitting them into three groups to read book chapters (Rosen). Group one's instructions were to just read the chapters and then take a test over them. Group two's instructions were to do the same but the researchers sent them text messages while reading and before their test. Group three's instructions were to also read the chapters and take a test but they were sent text messages sent without a pattern to simulate how typical college students get messages today. All students did well on the test but it took group two longer to finish the reading and the test and it took group three the longest of them all. Group three also reported to be more stressed when they were trying to focus on the reading. In conclusion, today's students are likely to take longer on school work and feel they are under more stress while doing so due to having the learned urge of checking their devices to see if anyone messages them. This relates to my methodology because I based my study off of this experiment but I focused on how the interruptions of social media affected specifically Advanced Placement students and not college students because of the lack of research.

Similarly, another study was conducted, performed by Rosen and colleagues, by telling students to study something important for only 15 minutes. The results show that the students who had mobile devices by them were more off task compared to those who didn't have their devices in sight or near them. This study was retested years later and showed that when these students who were off task focused their attention on social media platforms more than ¾ of the time.This highlights the impact social media has on these students even when they aren't on mobile devices due to their addictive qualities and built in algorithms. It was also concluded that, "In 2016, students unlocked their phones

about 60 times a day and used them for a total of 220 minutes. One year later, a comparable group unlocked their phones only 50 times per day, but they used them more, totaling 262 minutes per day (or an average of more than five minutes every time they unlocked their phones, up from four minutes the previous year)" (Rosen 4). This emphasizes that even though in recent years on average people open their phones less they are using them more which is more of a distraction because they are using these devices longer. This contributes to the shortened attention spans of adolescents especially during studying because it is an undesirable task to most and teenagers would rather be on an algorithm based app that keeps them entertained.

3. Methodology

3.1 Participants

My study focused on students, in the highschool grades of sophomore, junior, and seniors, that are in Advanced Placement classes to examine their own personal experiences of how social media distracts them from their studies. The experiment measured both qualitative and quantitative data by including a graded quiz and open-ended responses during the post quiz questionnaire. All participants are enrolled in high school in Texas. Participants varied in gender, age, and types of advanced placement classes they were in causing the varied accounts for diversity in results due to these differences.

3.2 Procedure

First to start my experiment I had to select a group I would want to perform my experiment on to get the most accurate results. I chose Advanced Placement students because there was limited research done on highschool students and even less on high school students that are taking college classes. I also chose this demographic because Advanced Placement students have more of an interest in their education than since they selected to be in college classes willingly. Once this was selected I moved on to find a handful of Advanced Placement classes I could perform my experiment on. This was an obstacle due to the rigorous coursework these students have to abide by so I had to turn to the classes with more of a lenient schedule- AP Seminar and AP Research. After the demographic was fully selected I was able to create a Consent Form to ensure that my participants were willing and had parent/guardian permission since a majority of the individuals were minors. Once I collected all of the Consent Forms I was able to set two days to conduct my experiment as well as randomly put the individuals into experimental groups. At the beginning of the experiment the participants were either told to put their phone on *do not disturb* or turn their device completely off and place it on their desk face up.

Participants were separated into three different groups that had slightly different circumstances. Group 1 was my constant because they turned their cellular device completely off to where no notifications were able to get through to participants to set my baseline of how most tests are given to students. Group 2 was sent notifications every 5 minutes during the quiz with a *do not disturb* setting on their cellular device to only receive notifications from the experiment to ensure that they would get the notifications that simulated the messages that social media sites send out once a day. Group 3 received notifications from the experiment sporadically, to simulate how social media notifies its users, throughout the duration of the experiment with the same *do not disturb* setting on from Group 2.

All 3 groups were given 3 questionnaires one before the quiz, one which was the quiz, and one after the quiz. The questionnaires were sent out through email and completed electronically like most of the tests that are given out in their Advanced Placement classes.

The first questionnaire, labeled Research Questionnaire, collected information about the participants' amount of Advanced Placement courses they are currently taking along with their grade level, if they get anxious test taking, and if their anxiety affects their test taking abilities. These baseline questions established the demographic of students as well as established how exposed the participants have been to the style of questions in the comprehension quiz they took after due to the advanced question style. The second questionnaire was comprehension questions about the speech, The Eulogy of the Martyred Children by Martin Luther King Jr, the participants read before opening the second quiz-labeled The Eulogy of the Martyred Children Quiz. This quiz was ten questions that were parallel to

SAT, Scholastic Aptitude Test, style questions. I chose this style of questions because they are designed to encompass a full understanding of the text paired with them. Participants were not able to refer back to the text to test if they really were able to comprehend the text while being interrupted. The third questionnaire, Debrief Questionnaire, asked the participants for feedback about how they felt about either receiving notifications or not receiving any notifications during the experiment and if they think they did well on the quiz. This questionnaire also included a question on if they felt if they were distracted which is what my research was mainly based around. These questionnaires were able to give me data about their anxiety levels while test taking due to some individuals including this in their free response answer, and if it affected their test taking abilities, as well as showed if the more time spent on social media affected their ability to study/comprehend information that they will be tested over. This experiment was modeled off of Laura Bowman's Student Distraction experiment that was conducted at Connecticut State University but adapted to determine if the distractions would be different in Advanced Placement high school students.

3.3 Ethical Consideration

All participant's identities will remain anonymous. The information that was collected from participants prior to the experiment will be kept confidential and the data that was collected does not have any identifiable information. The participants also all turned in a consent form that included a disclaimer that only their phone numbers would be used in the experiment and would be kept confidential as well.

3.4 Instruments

Multiple surveys were administered to all participants in order to conduct my research and collect data. The data collection method was a series of questionnaires and a ten question test. This data collection method was selected to be efficient for many responses and for it to be easy to access. The data collection was based on the experiment that was done by Laura Bowman in the peer reviewed study *The Distracted Mind- Enhancing its Focus and Attention* (Rosen). Other methods would have not been able to accurately receive the data I need for my research because replicating the experiment would make for real data that is legitimate to analyze. Replicating this study also encompasses what I want to focus on for my study but on a different demographic. Participant responses are authentic and have not been manipulated ensuring quality results with this method as well.

4. Results

4.1 Demographic

Thirty- three highschool aged students in Advanced Placement classes in the South Texas area completed the questionnaires- Research Questionnaire, The Eulogy of the Martyred Children Quiz, and the Debrief Questionnaire. The only factors that split the participants into groups for analysis was if the individual had social media and the group they were randomly assigned to for the extent of the experiment. The grade levels of the participants ranged from tenth grade to twelfth grade but had no significant impact on the research.

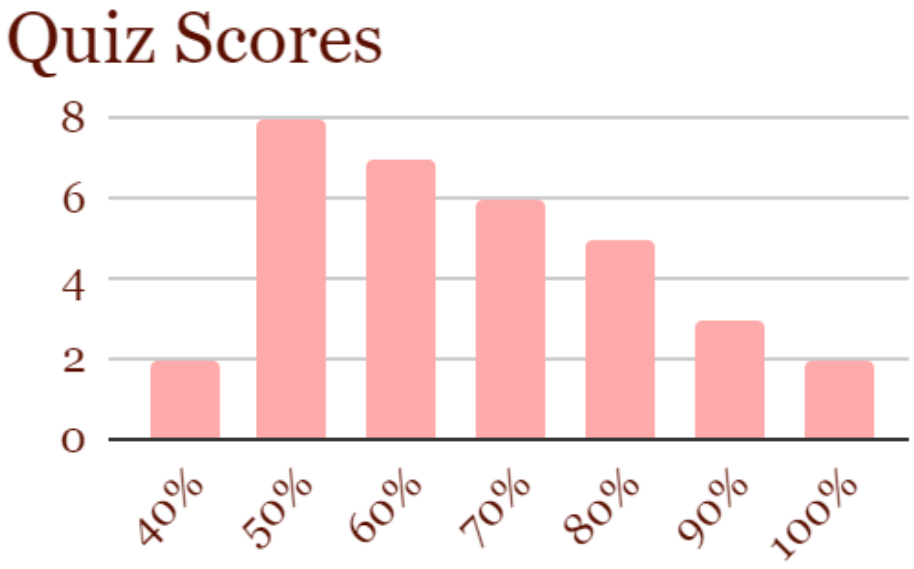

Figure 1: Eulogy of Martyred Children Quiz Scores

4.2 Descriptive Statistics

The participating students were categorized into three sample groups at random ensuring there was no group bias on my part-the experimenter. Group one, those who turned their phone completely off, had seven participants; Group two, those who received messages every five minutes, had fourteen participants; and Group three, those who received messages sporadically, had twelve participants, combining these groups made up my testing sample of Advanced Placement students. Overall the average score on the comprehension quiz was a 6/10 as shown in Figure 1. While this is a lower score for Advanced Placement students it shows that the material was around the difficulty they are tested on regularly in their classes. However even though I provided a quiz for the participants to take, it didn't contribute greatly to my research due to it not being the focal point of what the data was providing. While the scores did show those who scored higher were a part of group three which was unexpected because they were *distracted* by their mobile devices more than others. The quiz grade distribution was also even among all the groups even with those who scored the highest were a part of Group 3. These individuals, however, did feel like they were very distracted throughout the whole experiment and kept wondering what the messages were as reported in the free response section in the Debrief Questionnaire. This emphasizes that when an adolescent receives a social media notification they are more likely to look at their phone while they are doing something else that can include school work or other activities.

Another notable observation was that even though the higher scoring students succeeded on the comprehension quiz they did take around an average of two extra minutes to complete their quizzes and took about an average of a minute longer to read the material. Those in the control group, Group one, on average took a long less time to both read the material and complete the quiz. This was also found to be a common factor in Laura Bowman's experiment on college students which aided in my research because it shows that there is a relationship between social media interruptions and adolescents study habits.

Other participants, who scored lower, in the study also included in the free response section of the Debrief Questionnaire that they did check their phone to see what the notifications were. The average percent of participants who were distracted was 96.3% of the groups that got notifications which is the majority. Overall this shows that no matter what score an individual got they were distracted if they were in Groups 1 or 2.

Another imperative observation made is that those who spend longer on social media a day reported that they were more distracted than others. With this knowledge it proves that social media is

causing distractions towards adolescents especially during times that are devoted to studying or other academic activities. Those who scored a 40% on the Eulogy of the Martyred Children Quiz were the same individuals that are on social media for five plus hours a day adding to this claim. With the increased time on social media adolescents will start to become addicted to the serotonin levels it gives them which makes them want to continue to answer every notification they get. This satisfaction is parallel to how the brain reacts when an individual eats a bar of chocolate which creates a false sense of happiness (Social Media 'Likes' As Yummy as Chocolate).

Individuals also had another response to the interruptions during the experiment. In the free response section of my Debrief Questionnaire many participants claimed that they started to wait for the next interruption to be sent out. They were feeling anticipation and this was a big contributing factor to how distracted they were during the duration of the experiment. With this feeling the individuals would then be wondering when the next interruption would be sent causing them to be thinking about the way the experiment was set up rather than them focusing on the task of reading or answering the questions. This was a hidden factor in the experiment that many individuals didn't think about because the messages were the *main* distraction that was the reason for the longer time individuals spent completing the experiment. This distraction was a main effect of social media especially after a student sends a message on an app or posts something creating a never ending loop of constant interruptions and anticipation.

5. Conclusion

5.1 Non-users

Those who were not users of social media contributed to my research in many ways. These individuals were few but they were the quickest finishers of all of the questionnaires as well as the least distracted next to Group 1, the control group. This evidence highlights that no matter what group the non-users are in they were able to be less distracted because they are not as predisposed to the interruptions like those with social media are. This means that throughout all tasks that require the attention that school needs non-users are better candidates to complete faster. This has become more prevalent in highschool adolescents due to the decrease of individuals who are not on social media which affects the attention of students in academic settings.

5.2 Disruptions

Throughout this experiment a common occurrence happened with Groups 2 and 3. All of the participants tried to multitask during the duration of the experiment when they kept reading to comprehend while trying to check to see what the interruption was. While many think multitasking is real it actually cannot happen because one person cannot give two different tasks one hundred percent of their attention therefore one task is not getting done to the fullest potential. This led to the disruptions causing the participants to lose their train of thought.

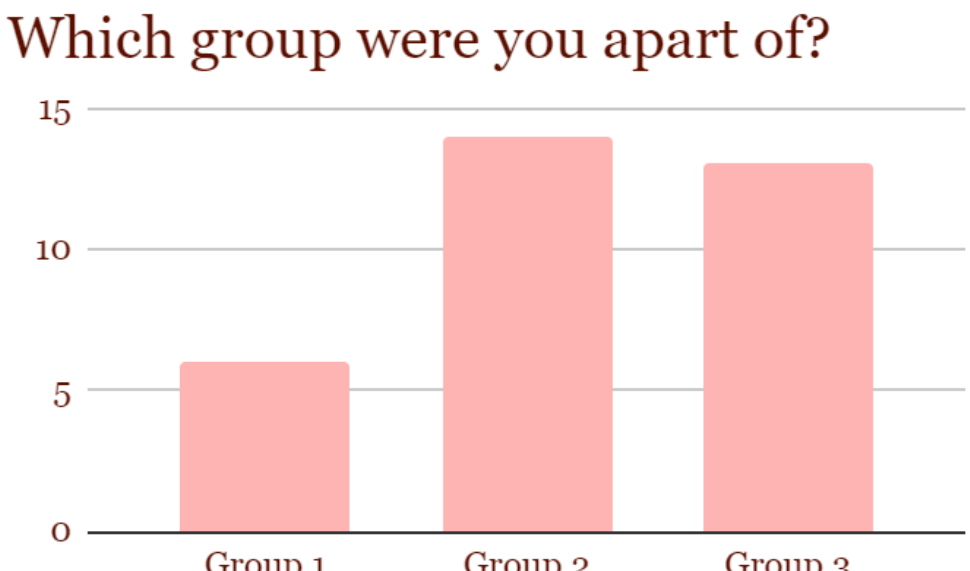

Figure 2: Group Distribution

5.3 Limitations to Research

Throughout my research I attempted to be as thorough as possible with my questions, analysis, and research. Some limitations that I would like to address that occurred are the disrupted skew of the sections of my group. Figure 2 shown above demonstrates the skew of the participant groups due to the amount of people who did not turn in a consent form. I did not let these willing individuals participate to maintain my prior decision to get consent for each participant as well as their guardian to ensure that everyone wants to participate and allow me to give them my experiment. Another reason for the disrupted distribution of the participants was the amount of students in the classes I chose to give my experiment too. The class that was randomly split for Group 2 and Group 3 had a total of thirty-five students and twenty-eight students participated in the experiment, on the contrary, the class that was used for Group 1 was seventeen students and only six were able to participate. With these uneven numbers it led to a limitation because of how small the control group, Group 1, was and contributed to the difficulty of getting a wide spread of results to analyze with the other larger participant samples. This limitation did not lead to any issues with my findings because the control group was used to set a baseline of how fast Advanced Placement students finish a comprehension quiz without any social media distractions.

Another limitation that was discovered was that testing anxiety should have its own section in a questionnaire to adequately make sure it's tested fully. One question that should have been added to the Debrief Questionnaire is if the participants felt anxious at all during the experiment. By asking this question I could have compiled more information on how the interruptions of social media affects the anxiety levels of students. It would also let me not rely on the individuals who claimed in their free response questions that they felt anxious because of the notifications. The addition of this question would have just solidified my research by having more individual responses.

Through this research as well as the peer reviewed papers included they highlight that the interruptions of social media does affect adolescents' study habits and anxieties with school due to social media’s influence on behaviors. This research can help those who work with adolescents in the education system by informing them of how adolescents’ brains react to social media and how it causes them distress due to the shortened attention spans. This research would be able to help mothers decide if they want to allow their children to have social media but also aid social media manufacturers to make corrections to their apps to keep their audience engaged. Future research for this topic can further the knowledge of how social media not only affects adolescents in school but also how it affects their everyday lives and communication skills. This future research should focus on the longevity of social media’s effects on adolescents' school habits and if it will lead to major interruptions of any concentration and not just in schools.

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