

Analyzing the Effects of TikTok on the Attention Span of Evolving High School Students

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This study investigates the influence of the social media app, TikTok, on the attention spans of freshman high school students at a public high school in Overland Park, Kansas. The research covers the history and science of the notable social media site, the problem arising from its use, the effects on its magnified demographic, and a research question that focuses on the app's consequences for high school students, specifically in a classroom setting. An extensive literature review was executed to find sufficient gaps regarding this media platform and its effects. The research performed narrowed down the overall focus of this study to initiate a plan to investigate the missing holes regarding this topic.

The methodology was then carried out, including an experimental, two-sample test design creating a classroom simulation, followed by a questionnaire serving as the research instrument. The population measured for this experiment consisted of a set of freshmen at a local high school who willingly participated in the study, being randomly selected to be present in two different conditions. With the size of the population and research instrument in mind, it was concluded that the most appropriate way of analyzing the final data consisted of calculating the percentages of the overall correct answers between the two groups as well as the correct percentages regarding the placements of questions to determine whether TikTok was negatively impacting the students measured. After extensive examination, the findings of this study indicated that TikTok did have a greater negative influence on the attention spans of freshman students, affecting the way they absorb information during lecture lessons. This study can be a platform for students, as well as teachers, to become aware of the effects of the popular social media app to monitor its use without impacting their academic performances.

Introduction

The rapid advancement of technology over the decades has given rise to a new era of communication, particularly through the emergence of social media applications. Social media can be defined as a form of mass media communication through which users share information, ideas, messages, and other content, according to the Encyclopedia of Britannica (The

Editors Of, 2024). The earliest forms of online communication began with email operations, enabling users to interact through private systems. However, by the 21st century, new forms of public communication began to develop, connecting society through platforms such as Facebook, YouTube, and LinkedIn. Among the multitude of social media apps that have emerged in recent years, one platform stands out: TikTok.

Before the development of TikTok, an app called Musical.ly, founded by Alex Zhu and Luyu Yang in September 2015, dominated the realm of short-clip media. The app rapidly gained success among Americans, attracting tens of millions of users by 2017. It facilitated content like lip-syncing, dancing, and comedy videos, with direct messaging options enhancing community engagement. By the end of 2017, ByteDance, a Chinese company founded by Zheng Yiming, acquired Musical.ly for \$800 million. After only a few months of operation, ByteDance struggled to continue to expand Musical.ly, leading to its shutdown at the beginning of 2018 (Failory, n.d). However, Zheng Yiming saw great potential in short-clip media and decided to reboot and transform the app into the new concept of TikTok that same year.

The launch of TikTok sparked widespread interest in its new and diverse features including video content, shopping options, direct messaging, and live streaming capabilities. Quickly, expanding to 160 different countries, the app garnered over 1.1 billion users, with 220 million being from the United States alone. As of January 2024, approximately 60% of TikTok's user base falls into the Generation Z demographic, ranging between the ages of 12-27 (Doyle, 2024). Economically, the app has also soared to remarkable heights, forecasted to hit nearly \$17.2 billion in ad revenue by the end of 2024 (Oberlo, 2024).

With the great traction that TikTok was able to gain, the question arises: what sets TikTok apart from its predecessor, Musical.ly, under the leadership of ByteDance? When reinventing the social media landscape with TikTok, Yiming sought to create changes within the app to avoid failure. He differentiated the app by integrating early Artificial Intelligence (AI) into its system, an approach that had not been seen in other social media platforms. According to Christian Montag, Professor of Molecular Psychology at Ulm University, TikTok's "For You" Page utilizes AI to cycle content tailored to user preferences, fostering a repetitive viewing experience (Elhai, et al., 2021). While AI integration contributed to TikTok's significant growth, it also introduced a new challenge among users: Dopamine addiction.

Science Behind TikTok's Cycling System

While TikTok has emerged as a powerful platform, connecting millions worldwide, it's crucial to understand its appeal. One key factor for its widespread success in connecting diverse communities is TikTok's sheer ability to reproduce a wide array of content that meets the needs of

individual users. From comedy, lip-syncing, challenging, sports, and even educational content, the app caters to a broad spectrum of demographics. Since its launch in 2018, the app has attracted nearly one billion active users each month. However, the true allure of TikTok lies in the integration of Artificial Intelligence found alongside the “For You Page” system. By leveraging AI algorithms, the system can detect individual user interests based on what they like, share, favorite, or comment on a video. The advanced system is then able to customize a cycle system of content into the “For You” Page, fostering an emotional connection between users and the clips they are linked with. In creating such an advanced algorithm, the design doesn’t account for the great connection that users feel for the endless amount of targeted content, enhancing individual usability and appeal. The constant stream of tailored content creates an addictive nature for TikTok as users are being fueled by a dopamine release each time they are met with an engaging video (MHealth, 2023).

To dig further into the addictive nature of TikTok, it is crucial to recognize the role of AI-generated connections in influencing individual dopamine levels. According to the National Library of Medicine, dopamine, a neurotransmitter, increases in response to any type of reward or stimulation, potentially leading to oxidative stress if overindulged (Garcia et al., 2015). In the case of TikTok, each video is carefully curated through the algorithm-generated feed, releasing a surge of dopamine as users encounter videos aligned with their preferences, reinforcing the brain’s reward system. The continuous cycle of curated content leads to users facing a barrage of dopamine, contributing to TikTok’s addictive nature (The Insidious Effects, 2023).

Why is an Influx of Dopamine Problematic?

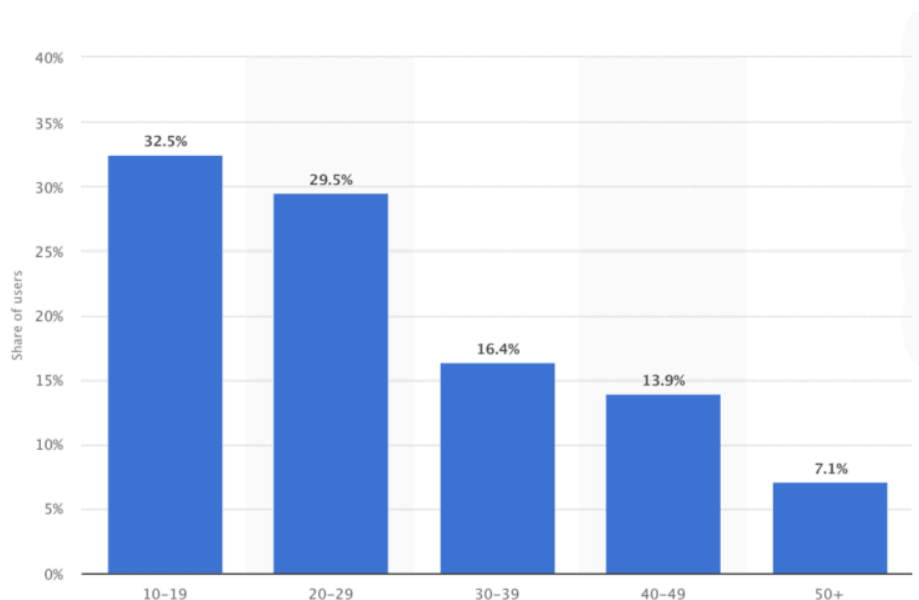


FIGURE 1. Adapted from “TikTok Statistics,” by Wallaroo Media, 2024, Wallaroo Media.

As highlighted in the graph, more than half of all TikTok users belong to the Gen Z category (Figure 1). Nearly 32.5% of users are between the ages of 10 and 19, while another 29.5% fall into the 20-29 age range. Given that the human brain doesn’t reach maximum maturity until the late twenties, the effects of TikTok impact the developing minds of younger users, according to the National Institute of Health (U.S. Department of, 2023). TikTok’s algorithm-generated “For You” page provides a continuous cycle of user-appealed videos, leading to heightened dopamine intake among young users, and posing problematic challenges for their long-term development.

For starters, an excess of dopamine exposure during adolescence can desensitize the brain to accustom lower levels of stimulation, making it difficult for users to find satisfaction in non-digital activities (The Insidious Effects, 2023). This means that the overuse of TikTok for younger users will make it difficult for individuals to enjoy past hobbies that once pleased them, being replaced by the appeal of the short-clip media platform. Additionally, the influx of dopamine from an overuse of TikTok can disrupt the memory formation and consolidation of developing minds. Research published in the journal *Nature Human Behavior* highlights how the consumption of stimuli affects the brain’s ability to process and store information (The Insidious Effects, 2023). This makes it difficult for users to maintain their attention span for long periods, compromising their ability to focus more precisely. Next, Jayne Conroy, litigator and leader of Simmons Hanly Conroy, continues to illustrate TikTok’s harmful addictive design, mentioning that adolescent brains, which are more vulnerable to incomplete development, fall at greater risk for the algorithmically curated content of the app (Dooley, n.d.). The multitude of health threats that the app poses amongst users leads to questions regarding how impactful its addictive nature can be. Considering the health flaws that arise from the impact of overuse of TikTok amongst Gen-Z users, it’s crucial to examine how the app’s addictive nature impacts their ability to perform day-to-day activities.

Research Question

With the intricate science behind TikTok’s algorithm cycle in mind, it is important to delve deeper into the effects of the addictive nature on adolescents during their daily activities. Given that most teenagers spend the bulk of their days at school, it is crucial to examine the effects of the app during educational hours. This prompts the question; How does the use of TikTok during a class lecture affect the overall attention span of high school Freshmen students?

Literature Review

To delve deeper into the various factors that led to this specific area of study, it is first important to recognize the surrounding studies that build the platform of this topic.

While social media has taken the world by storm, there are many criticisms associated with the use of such platforms. Daisy Yuhas, a journalist from the *Scientific American*, describes the impacts of the overuse of social media, ranging from disrupted sleep to poor self-esteem and negative health consequences (Yuhas, 2022). Yet, Ryan Kabting, a professor at the English Department of Education in the Philippines, highlights the inevitable presence of social media that has revolutionized the way students communicate and socialize as a part of their cultural fabric (Jimenez et al., 2021). The controversy of these apps seems to be overlooked, considering it has become such an integral part of this generation. With the continuous integration of technology and social media platforms into society, it's important to note when and where it is acceptable to access such apps. For students, questions arise as to whether easy access to social media should be allowed during classroom settings, considering their ability to retain information may be altered.

According to Adekunle Olutola, Raflu Olatoye, and Olatoye Ademola, doctors from the Department of Education and Science Foundations at the Federal University of Nigeria, there has been an increasing trend of social media incorporation amongst institutions to facilitate learning. Their quantitative assessment concluded that social media can be noted as beneficial for academic purposes since it is an inexpensive tool that allows for the exchange of information, ideas, and content (Ademola et. al, 2016). The use of such affordable platforms allows students the opportunity to enhance their academic performances by utilizing the study habits integrated and taught by individuals. While the platforms allow students to better their habits, past studies have shown that the presence of these apps has more negative impacts on the academic performances of students. A study conducted by Qingya Wang, Wei Chen, and Lu Jian, journalists from Johnson and Wales University, found that 80% of students that were sampled from the university admitted to using social media while simultaneously completing their school work. However, only 21% of the college students concluded that the use of these platforms helped them with completing their work (Wang et al., 2011). This indicated a negative correlation between social media use and academics as the students at Johnson and Wales University were aware that they were using these platforms when completing their education, despite knowing that it had no correspondence to helping them with their work.

When looking at the effects of social media on students, one

app in particular seemed to stand out tremendously, due to its ability to garner mass attraction: TikTok. In a study conducted by Qiyang Zhou and Heekyoung Jung, journalists from the University of Cincinnati, the reason why TikTok serves as a fast-growing app is because of the willingness of users to put themselves out there and join the reward system that the app has to offer. By analyzing content and reviewing a regression analysis, Zhou and Jung concluded that TikTok users are more willing to upload content on the app compared to other social media sites. (Yang, 2020). This, along with the young demographic of users, makes the app most susceptible to having significant effects on users. Additionally, their study concluded that the number of followers for individual users doesn't have any correlation to the likes and rewards they receive, clarifying that the platform is highly A.I. generated through this recommendation system. The algorithm-based cycle of TikTok also serves as a differing factor compared to all other platforms, since these apps are heavily follower-dependent and didn't start using a recommendation system until recently.

A final study conducted by Grace Okpongkpong, a professor at Imo State University, and Anne Bassey, a professor at the University of Lagos, concluded a negative correlation between the use of TikTok and the attention spans of University students at Rittman University. Using the Spearman correlation technique, the authors were able to identify that students in the mass communications department faced a negative impact regarding their academic pursuits when using TikTok during lessons due to its addictive nature. This resulted in a recommendation from lectures to ensure students do not use their phones, or specifically TikTok, during their lecture hours (Bassey, Okpongkpong, 2023). With this study indicating negative correlations between University students, it's important to recognize whether TikTok has the same effects on developing teenagers, specifically Freshmen. Since TikTok is a relatively new app, there have been few studies done to recognize whether there is a correlation between academic performance and the use of the app within a high school community. Using freshmen high schoolers as the main target, these results can be more easily detected to better enhance their life-long study habits.

The Gap in the Research

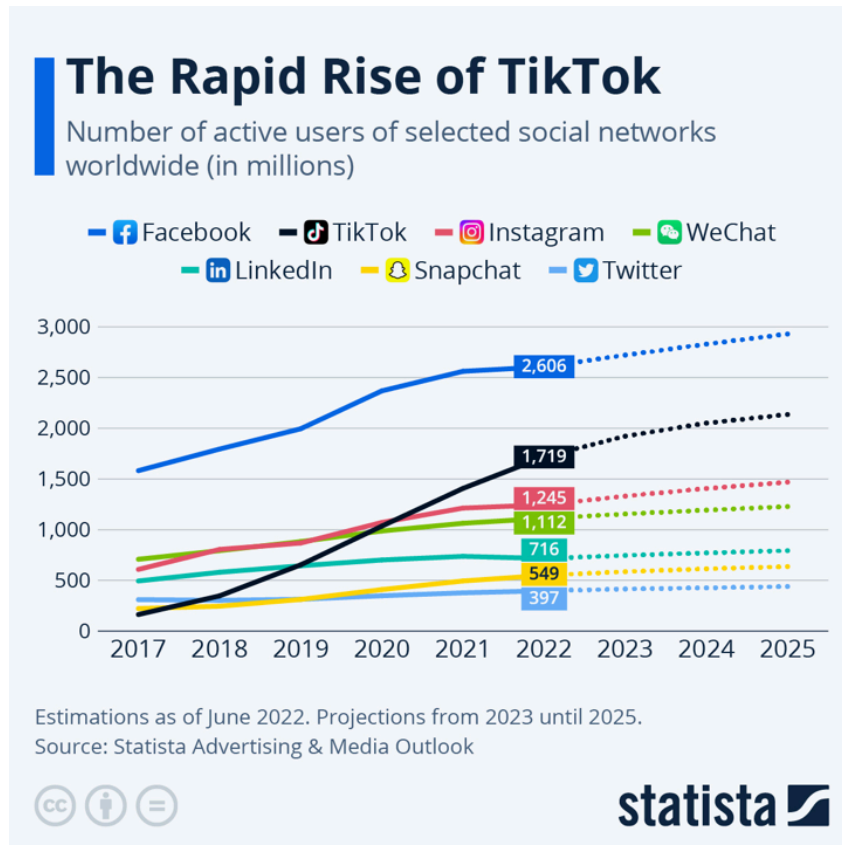


FIGURE 2. Adapted from “Social Media Users by Network,” by Statista, 2024, *Statista*

To break down the inquiry guiding this specific study, it is important to analyze the three different factors that were taken into account from the literature review when honing in on the effects of an influx of dopamine intake via social media. These factors included A) identifying the app that posed the largest effects on adolescents, B) pinpointing the specific demographic necessary for studying the effects of the app, and C) establishing the specific environment in which the app displayed the greatest effects.

Why TikTok?

The decision to focus on TikTok for this research stems from the app's originality, which contributed to its rapid growth and the development of features that have raised concerns about their impact on attention spans, particularly in comparison to other social media platforms. Since its launch in 2018, TikTok has rapidly become the fastest-growing social media platform, reaching over one billion monthly active users by 2021—surpassing Facebook, which achieved the same milestone in eight years (Forbes Staff, 2021). The graph provided above further illustrates the rapid growth of TikTok, showing how it quickly surpassed other popular media platforms (Buccholz, 2024). However,

what sets Tik Tok apart from other platforms is its initial integration of artificial intelligence. The app's "For You" page customizes content per each user's preference, creating a highly personalized and addictive experience. This newly introduced method of displaying content encourages users to scroll a continuous stream of short engaging videos that demand minimal engagement, leading to shorter attention spans over time.

Other social media platforms, like Youtube, Instagram, and Facebook, were considered for this experiment, but were ultimately excluded. While these apps do feature short-form video content, they lack the same AI driven personalization that TikTok pioneered. For example, Youtube Shorts and Instagram Reels are less effective in this research because they don't rely on the same sophisticated recommendation algorithms. Although these platforms do generate a content pattern over time, TikTok more quickly detects user preferences through interactions like likes, comments, shares, and saves. Additionally, these platforms offer a wider variety of content types, such as photos, stories, and shopping options, which can disrupt the seamless, user-centered content experience that TikTok provides. With three billion lifetime downloads, TikTok's ability to capture user attention is unmatched, making it a particularly relevant app for examining the effects of social media on attention spans (Argoid, n.d). Ultimately, TikTok's stream of personalized videos is uniquely designed for user engagement in a way that other platforms don't replicate, making it particularly concerning.

Why Freshmen High Schoolers?

When determining the target population to measure the effects of TikTok, the focus naturally gravitated towards the main demographic of the app: adolescents belonging to Generation Z. Given findings of an influx of dopamine intake having larger effects on younger users, this demographic emerged as a suitable target for examining TikTok's impact. Among this generation, high school students emerged as the most appropriate group for this study, specifically Freshmen. The effects of TikTok pose the greatest threat to developing minds, as they contend with a daily influx of dopamine. The less developed the brain, the more susceptible it is to developing detrimental habits and becoming addicted to TikTok's dopamine-driven system.

While there have been varying studies done regarding the effects of TikTok on University students (found in the literature review), high school students have never been further measured. As a result, Freshmen were chosen specifically due to their ongoing development, both physiologically and educationally. The transition from middle to high school for freshmen is a critical time that is heavily influenced by environmental factors, including social media. It is imperative to determine whether TikTok truly harms the adjusting

adolescent mind.

Why Lecture Lessons?

The final factor taken into consideration when determining the specifics of this study was the environment where adolescents would be most impacted by the use of TikTok--namely, the classroom setting. On average, high school students spend nearly 1080 hours at school each year, learning various skills through a multitude of subjects (Collegiate Parent, n.d.). The ability of Freshmen to stay focused during these extensive hours is pivotal for building their platform of intelligence for the future. The study and focus habits Freshmen develop in their inaugural year can significantly impact their academic trajectory through high school, and even into college. The primary time when students are expected to be engaged in their studies is during teacher lectures on essential topics.

When choosing a specific classroom setting to study, it became clear that focusing on a single area would overlook many critical details. Therefore, the decision to focus on an Advisory classroom (a general, ungraded classroom available at this local high school), was pivotal in serving as the environment in determining whether the presence of TikTok as a dopamine-driven distraction had negative effects in a general lecture setting.

Significance of Study

This study holds significant implications for either validating or rejecting the controversy surrounding the use of TikTok amongst adolescents during school hours. The findings will provide valuable insights for educational institutions and policymakers to shed light on whether the app should be integrated into classrooms without negatively affecting the attention spans of students. By investigating the effects of TikTok on academic performances, the study will be able to uncover whether there is a negative correlation associated with elevated levels of dopamine during school hours, with TikTok influencing their attention spans during lecture lessons. Determining whether the effects of TikTok are detrimental to the ability of freshmen to retain information will help inform future decisions regarding cell phone policies in classroom settings. Ultimately, this study aims to contribute to the ongoing controversy of TikTok use from an educational standpoint, examining its impacts on student learning.

Research Hypothesis

Null Hypothesis: The use of TikTok during a general lecture does not affect the attention spans of freshmen students and their ability to retain information

Alternative Hypothesis A: The use of TikTok during a general lecture

negatively affects the attention spans of freshmen students and their ability to retain information

Alternative Hypothesis B: The use of TikTok during a general lecture positively affects the attention spans of freshmen students and their ability to retain information

Methodology

This study was conducted using two steps: the first being an experimental two-sample simulation, the second being a quantitative survey designed as a questionnaire.

Step I: Experimental Simulation

To fully grasp the true effects of TikTok on freshmen students during class lectures, it was imperative to create a method that accurately simulated a classroom setting. Having the sample of students placed in true classroom settings with a teacher performing a real lecture would be most beneficial in accurately measuring the impact of TikTok. When choosing a specific classroom, this high school's "Advisory Hour" became most valuable to this experiment. Advisory is a non-graded classroom in which students are still required to fulfill general lecture lessons about important academic concepts (general lectures, study habits, ACT/SAT prep work, etc.). While there were concerns about the extent of seriousness that students felt regarding the class, it was imperative to have the affected freshmen face no academic repercussions when participating in this study, resulting in the choice of using a non-graded classroom.

The lesson given to all students during this experiment was a topic relevant to study habits (carrying the pattern of lectures that had been given weeks prior) (Appendix B). There were two classrooms selected to have this identical lecture given to, each with twenty-three students. While the teachers presenting the lectures to the students in each class differed, the lectures were given at simultaneous times with identical scripts for teachers to follow along with (Appendix C, D). This way, students would be faced with absolutely identical environments. The only factor differing between the classrooms would be the conditions in which students were allowed to access TikTok. This brings us to the dividing factor of Class A and Class B.

Class A, having twenty-three students, was allowed the opportunity to access their phones, with the exception that they were only allowed to access TikTok. Students weren't required to be on TikTok during the lecture, however, they did have the privilege if desired. Students were required to consent to participation in the experiment, in which they agreed to the conditions they would be placed under, to ensure that they were aware that they would ONLY be allowed to use TikTok (Appendix A). Additionally, students were

asked to be on their phones individually to prevent any outlier distractions amongst their peers. Lastly, as mentioned, the teacher present in Class A was given an identical presentation and script to be lectured to students (Appendix C).

Class B, having twenty-three students, was not allowed the opportunity to access TikTok at any time. Moreover, they were required to tuck away all electronic distractions from the beginning of the lecture to serve as the control group. Students were also required to consent to participation in the experiment, in which they agreed to the conditions they would be placed under (Appendix A). The teacher in Class B was given an identical presentation and script as Class A to be lectured to students (Appendix D).

To make sure that students were only accessing TikTok during the experiment, there were two behavioral analysts (two additional research students) placed in each of the classrooms, taking note of student behavior. This way, any outlier results would be accounted for. It is also important to note that TikTok is banned on school wifi for this high school. A condition that all students were required to meet was having the app of TikTok downloaded on their phones, and having cellular data to access the app (specifically for students placed in Class A).

Step II: Quantitative Questionnaire/Survey

The second part of this experiment consisted of a quantitative questionnaire. After students in each class watched the lecture given by their teachers with either the presence or absence of TikTok, a QR code was presented. This QR code held a Google form that served as the research tool for this questionnaire. The questionnaire was split into three parts: the first regarding personal information, the second regarding the lecture itself, and the third about opinions of technological use. All students taking the questionnaire were informed that answers would remain anonymous and were optional. It's important to examine each section of the quiz more thoroughly.

Section I- Personal Information: Students were asked general questions, including what class they were placed in, the types of classes they took, and how involved they were with activities. The purpose of this part of the questionnaire was to sort students into specific categories based on their general backgrounds so that the data could be better categorized.

Section II- Study Habits Quiz: As the presentation was about general study habits, thirteen questions in this section were designed to completely mirror the presentation. Questions were not meant to be tricky, rather, they were meant to measure how well students were able to grasp information from the lecture with the presence or absence of TikTok. All options were multiple choice to prevent any outlier answers. The importance of this section was to monitor how well

students retained the information learned in the conditions they were placed in.

Section III: TikTok-Based Questions: Students were finally asked questions regarding their personal opinions of TikTok and their technological use. The types of questions ranged from daily screen times to true-or-false statements about how students felt about the app. The purpose of this section was to have statistical evidence of student feelings to be correlated to how well students answered questions.

Data Presentation

Based on the questionnaire that was given to students after listening to identical lectures, it was decided to focus on the average percentages of correct answers between the two groups. This way, it could simply be determined if the presence or absence of TikTok resulted in one group scoring better than the other.

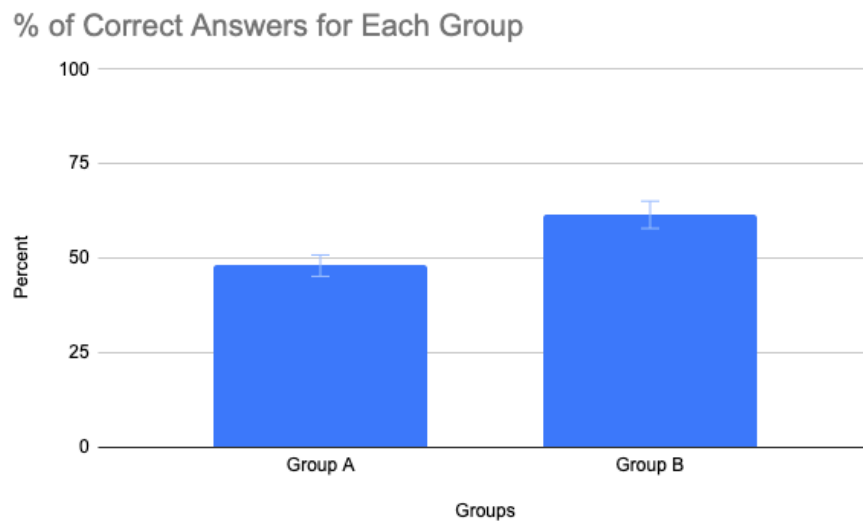


FIGURE 3. *Average Test Scores by TikTok Access Condition*

Furthermore, it was important to analyze whether the placements of questions also had an impact on the average correct answers that students received and to see if TikTok had a greater effect on students throughout certain points of the lecture.

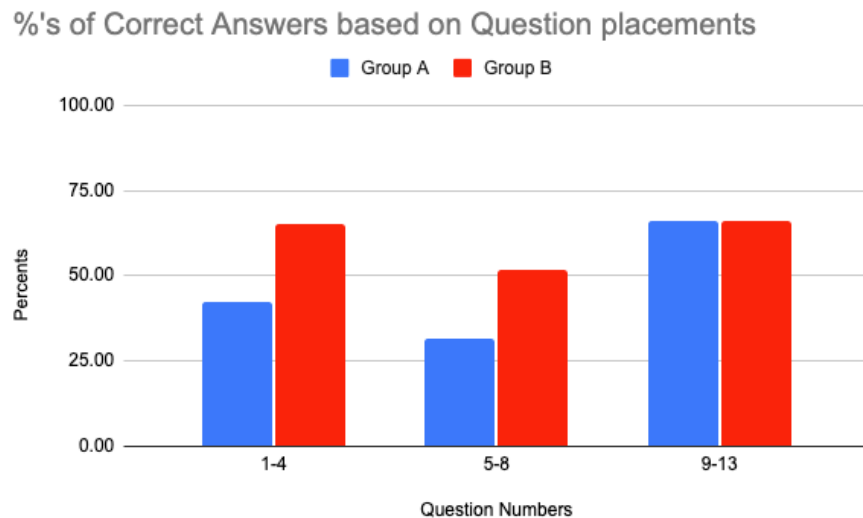


FIGURE 3. *Averages of Correct Answers Based on Question Orders*

After gathering data, it was concluded that the attention spans of the students did vary based on the order of the questions, but were still correlated with the condition to which they were assigned.

Analysis

Findings #1 (Appendix F, Figure 3): Based on the averages of correct answers between the two groups, we found that Class A and Class B had great statistical significance, based on the non-overlapping standard error bars seen in the graphs. Group A (who had access to TikTok during the lecture) scored much lower than Group B (who did not have access to TikTok) (Figure 3). A reason for this is that students who had the option to access TikTok paid less attention to the lecture lesson, leading to their overall score. The app may have served as a distraction in their classroom performance, leading to a negative correlation between the number of correct answers and the presence of the app.

Findings #2 (Appendix F, Figure 4): After seeing the differing averages of correct answers between Group A and Group B, it became imperative to analyze whether the placements of these questions also had any correlation to the performance of students, with the presence or absence of the app. Based on the results, calculated later into Google Sheets, it was concluded that Group A scored less than Group B through questions 1-4. This pattern could then be seen through questions 5-8. However, by questions 9-13, the average percentages of correct answers between the two groups even out (Figure 4). This could be explained by two reasons: 1) Questions 9-13 could have been designed more simply, resulting in both groups answering them equally, or 2) Students in Group A may have felt more inclined to use TikTok towards the beginning of the lecture, but became more focused near the end, resulting in the difference of correct answers throughout the

placements of questions. Based on the observations conducted by the behavioral analysts, it was determined that reason two was more observed, distributing back to the addictive nature of the app.

Survey Findings

Before making conclusions, the backgrounds of students and their technological uses needed to be thoroughly analyzed as well (Appendix F). The survey section of the questionnaire (part 3) served as this platform, asking true or false statements regarding student opinions on TikTok and the amount of time spent on the app.

How Much of a Student's Screen Time is Made of Tiktok?

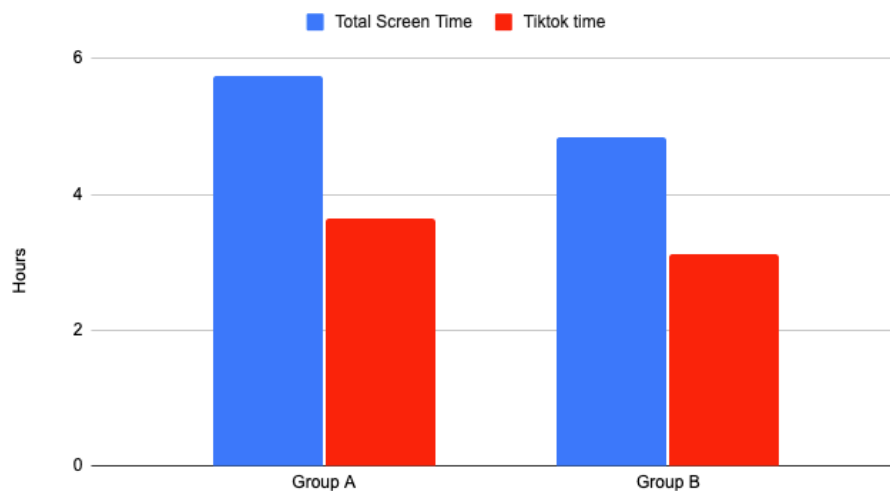


FIGURE 5. *Total Screen Time Versus TikTok Screen Time for the Average Student*

To determine how connected students felt with TikTok, an average of individual screen times (daily) was taken, along with the hours spent on TikTok. According to ByteDance, the parent company of TikTok, the daily average screen time for TikTok users is recommended to be around 60 minutes (The New York, 2023). Yet, based on the sample measured, the average daily screen time used on TikTok was around 3.65 hours for Group A, and 3.11 hours for Group B (Figure 5). The overuse in time for these freshmen using TikTok establishes the addictive nature of the app since students feel more inclined to use the app for longer time spans to maintain their high dopamine levels.

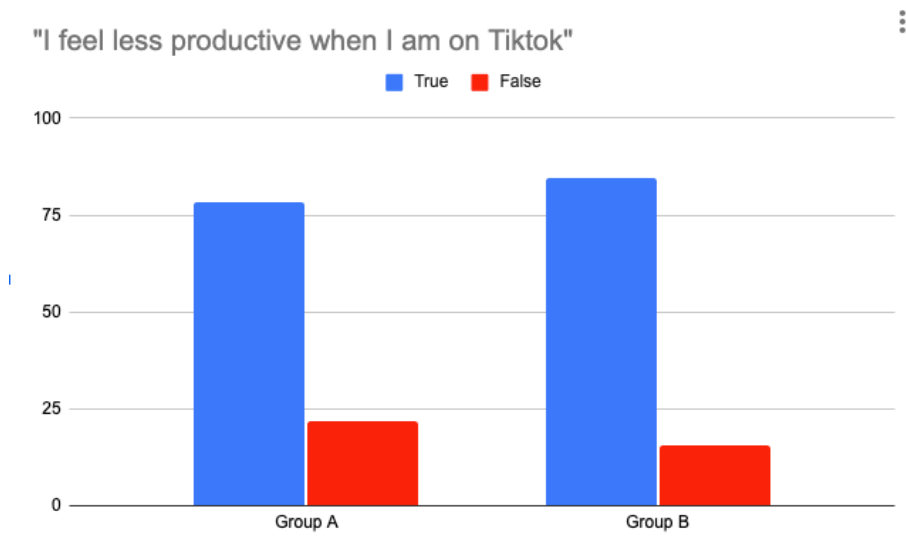


FIGURE 6. *Average Answers of True-Or-False Question Stating "I feel less productive when I am on TikTok"*

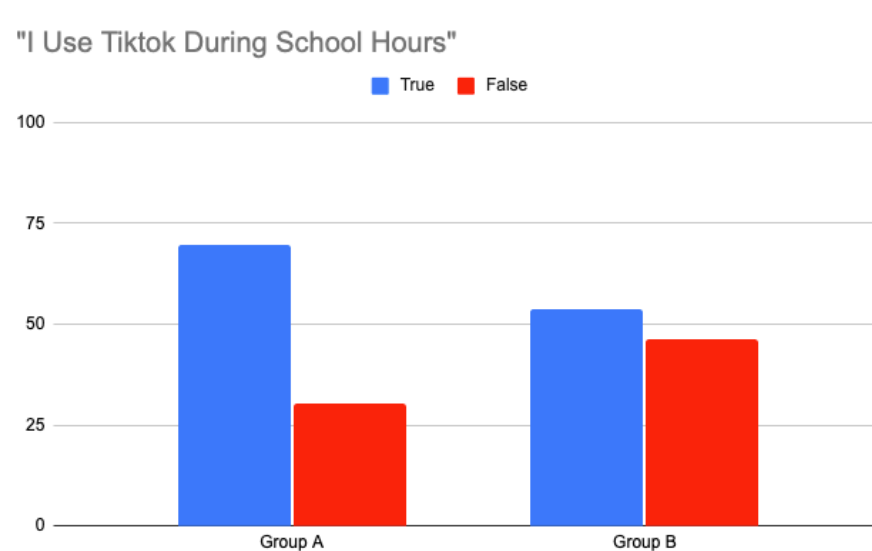


FIGURE 7. *Average Answers of True-or-False Question Stating "I Use TikTok during School Hours"*

The true-or-false results were then observed between the student groups to see how they felt about the presence of TikTok throughout their daily lives. Based on the first graph stating "I feel less productive when I am on TikTok", a total average of 81% of all of the students answered "True" to this statement (Figure 6). Another statement included "I use TikTok during school hours", with a total average of 61.2% of all students measured answering "True" to this statement as well (Figure 7). From these results, it was reasonable to conclude that students did have a relatively strong connection to the app, feeding back to its

addictive nature. While the results may have differed for individuals, the averages from the 46 freshmen measured helped to conclude that students were aware of the impacts of TikTok on their overall ability to retain information, despite them continuing to use it during school hours.

Conclusion

After examining results from the Google Forms questionnaire and transforming them into Google Sheets to generate statistics and graphs, a thorough analysis of the outcomes was conducted. The analysis and statistical significance between the graphs helped us conclude that the null hypothesis has been rejected, meaning that there was significant evidence supporting Alternative Hypothesis A, that TikTok indeed negatively affects the attention spans of freshman high school students during class lectures. The evidence behind this can be seen through the comparisons of average correct answers between Group A (access to TikTok) and Group B (no access to TikTok). As our data showed, Group B scored much higher than Group A, indicating that the presence of TikTok is to pinpoint the cause of lower correct answers since Group A tended to be more distracted by the app's presence. This can be linked back to the addictive nature of social media. TikTok's high reward system has caused students to reach such high levels of dopamine intake that, with the presence of the app, they depended on it to suffice these levels, even during an academic setting. Students in Group A had such a strong connection to the app that it led them to use it instead of paying greater attention to the lecture lesson.

Limitations

While this experiment rejected the null hypothesis, providing significant evidence for Alternate Hypothesis A, some limitations to this study are essential to address, to be better performed in the future. First, it's important to note that the sample size measured was relatively small and cannot be oriented for a full high school population. To meet full proficiency of the results, it would be beneficial to randomly select students from each level grade to then be divided and split into groups for the experiment to be performed so that it fulfills a high school standard. Additionally, reordering the design of this experiment to become a matched pairs design, rather than a two-sample test, can help to reduce any experimental error that may have occurred during this study, including some biases or outliers that were found within the results.

It is also imperative to recognize that some of the True-or-False statements in part three of the questionnaire had response biases, possibly influencing participants to answer questions precisely. Finally, using a subject-dependent class would be more impactful for truly

measuring how well students can pay attention to their lessons in the presence or absence of TikTok. Since the class used for this study was an Advisory class, which does not have oriented grades affecting student's grade point averages, students were already less inclined to pay as much attention to the general lessons taught. Changing the environment to a subject class can help truly measure a student's ability to retain academic knowledge.

Implications and Further Directions

In the end, the results of this study hold significant implications for students, educators, and educational policymakers alike. Following the publication of these findings, students may gain a heightened sense of prioritizing TikTok usage during class lessons. Reducing TikTok use during school hours may help mitigate its impact on students' ability to focus in academic settings, though broader interventions are needed to address digital addiction. Moreover, with TikTok bans becoming a national controversy with discussions regarding educational implications, districts nationwide may consider implementing more measures to monitor and limit the app on school wifi systems. Since this study has indicated TikTok's negative impact on student focus, decreasing its usage can be beneficial for all educational environments.

Furthermore, educators may also benefit from this study as well by becoming more cautious of TikTok incorporation into a classroom setting. Teachers may choose to discourage students from accessing the app during class hours to minimize distractions and maintain focus on academic content. Educators who have previously used TikTok as a teaching tool may reconsider this option, potentially exploring alternative approaches that do not involve this addictive social media site. Overall, this study serves as a valuable testament to promoting mindful social media use in educational settings to foster a learning environment for academic success.

References

- Ademola, O., Olatoye, R., & Olutola, A. (2016). Assessment of Social Media Utilization and Study Habit of Students of Tertiary Institutions in Katsina State. *Journal of Education and Practice*, 7(4). ResearchGate. https://www.researchgate.net/publication/309310376_Assessment_of_Social_Media_Utilization_and_Study_Habit_of_Students_of_Tertiary_Institutions_in_Katsina_State
- Argoid. (n.d.). The AI Algorithm That Got TikTok Users Hooked. Retrieved from <https://www.argoid.ai/blog/the-ai-algorithm-that-got-tiktok-users-hooked>
- Bassey, A., & Okpongpong, G. (2023). TikTok Effect on Academic Performance: A study of Rittman University Mass

- Communication Students. *IMSU Journal of Communication Studies*, 7(1). ResearchGate.
<https://www.imsujcs.com/Journals/2023/19.pdf>
- Buchholz, K. (2022, October 7). The Rapid Rise of Tiktok. *Statista*. Retrieved April 29, 2024, from
<https://www.statista.com/chart/28412/social-media-users-by-network-amo/>
- Carvalho, F., Costa, R., Klaus, A., Paixao, V., Silva, A., Silva, J., & Tang, J. (2023). Dynamic Behaviour Restructuring Mediates Dopamine-dependent Credit Assignment. *Nature*, (626).
<https://www.nature.com/articles/s41586-023-06941-5>
- Collegiate Parents. (n.d.). Student Study Time Matters. Retrieved from
<https://www.collegiateparent.com/academics/student-study-time-matters/#:~:text=In%20a%20180%20day%20school,4%E2%80%93935%20hours%2Fweek>
- Dooley, L. A. (n.d.). Social Detox. *ABA Journal*.
<https://research.ebsco.com/c/g2nxvp/viewer/html/Opuxlakelb>
- Doyle, B. (2024, January 5). TikTok Statistics. *Walloo*. Retrieved April 15, 2024, from
<https://wallaroomedia.com/blog/social-media/tiktok-statistics/>
- Elhai, J., Montag, C., & Yang, H. (2021). On the Psychology of Tiktok Use: A First Glimpse from Empirical Findings. *National Library of Medicine*, 9(641673). <https://doi.org/10.3389/Fpubh.2021.641673>
- Failory. (n.d.). Why Did Musical.ly Shut Down? Retrieved from
<https://www.failory.com/cemetery/musical-ly#:~:text=Why%20Did%20Musical.ly%20Shut,to%20expand%20into%20foreign%20markets>
- Forbes Staff. (2021, September 27). Tiktok Hits 1 Billion Monthly Active Users. *Forbes*. Retrieved April 29, 2024, from
<https://www.forbes.com/sites/marisadellatto/2021/09/27/tiktok-hits-1-billion-monthly-active-users/?sh=235707c244b6>
- Garcia, E., Guzman, D., Mejia, G., & Olguin, H. (2015). The Role of Dopamine and Its Dysfunction as a Consequence of Oxidative Stress. *National Library of Medicine*.
<https://doi.org/10.1155/2016/9730467>
- Jimenez, L., Kabigting, R., Mendoza, R., & Paner, A. (2021). Social Media Exposure and its Perceived Impact on Students' Home-Based Tasks Productivity. *Studies in Humanities and Education*, 2(1), 70-78. <https://doi.org/10.48185/she.v2i1.282>
- Jung, H., & Zhou, Q. (2019). Learning and Sharing Creative Skills with Short Videos: A Case Study of User Behavior in TikTok and Bilibili. *International Association of Societies of Design Research*. https://www.researchgate.net/publication/335335984_Learning_and_Sharing_Creative_Skills_with_Short_

- Videos_A_Case_Study_of_User_Behavior_in_TikTok_and_Bilibili
- MHealth. (2023, April 13). Why is Tiktok So Addictive? Experts Weigh in Amid New Safety Feature. Health Tech Digital. Retrieved April 29, 2024, from <https://www.healthtechdigital.com/why-is-tiktok-so-addictive-experts-weigh-in-amid-new-safety-feature/#:~:text=The%20social%20media%20platform%20allows,%2C%20fun%20and%20on%20trend>
- Oberlo. (2024). Tiktok Ad Revenue (2021-2025). Oberlo. Retrieved April 29, 2024, from <https://www.oberlo.com/statistics/tiktok-ad-revenue/#:~:text=In%20the%20US%2C%20the%20country,%2C%20a%2025%25%20a>
- The Editors of Encyclopaedia Britannica. (2024). Social Media. In Britannica. <https://www.britannica.com/topic/social-media>
- The Insidious Effects of Tiktok on the Human Brain. (2023). Digital Daze. Retrieved April 15, 2024, from <https://digitaldaze.io/the-insidious-effects-of-tiktok-on-the-human-brain/#:~:text=The%20constant%20barrage%20of%20dopamine,same%20level%20of%20dopamine%20release>
- The New York Times. (2023, March 23). TikTok's Screen Time. Retrieved from <https://www.nytimes.com/2023/03/23/business/tiktok-screen-time.html>
- U.S. Department of Health and Human Services. (2023). The Teen Brain: 7 Things to Know. National Institute of Mental Health. <https://www.nimh.nih.gov/health/publications/the-teen-brain-7-things-to-know/#:~:text=Adolescence%20is%20an%20important%20time%20for%20brain%20development.&text=The%20brain%20finishes%20developing%20and,the%20last%20p>
- Wang, Q., Chen, W., and Liang, Y. (2011). The Effects of Social Media on College Students. Johnson & Wales University, Providence, RI.
- Yang, Y. (2020). Understanding Young Adults' Tiktok Usage. UCSD Department of Communication.
- Yuhas, D. (2022). Why Social Media Makes People Unhappy. Scientific American, 327(6), 72-73. EBSCOhost. <https://research.ebsco.com/c/g2nxvp/viewer/html/ivqttidibfr>