

How does TikTok affect the cognitive function of Final year students at University of Galway?

Abstract

As a society which is constantly growing and evolving everyday especially in the online world, with new advances in technology one might wonder what these new advances in technology might entail for civilization and whether they have impacted us. This study focuses on the long term effect of continuous usage of social media more specifically the long term effect of continued use on the social media application known as TikTok. We aim to investigate if the application causes cognitive dysfunction such as concentration, learning difficulties and interrupted sleeping patterns. We have considered a multitude of factors in this study. We will begin our research by looking at social media, we will examine why it is so popular and frequently used in this day and age, along with the positive and negative impacts which social media has on our lives.

As our research progresses we will look at the effects that social media has on brain development and cognitive functions. After cognitive functions we will look at cognitive theories and how the brain develops from child to adolescent. Additionally we will investigate the influence which TikTok has on sleep which may lead to negative cognitive effects, poor academic performance, and decreased mood. Next we will look at TikTok and mental health and TikTok addiction. Our findings from our literary review and our surveyed students revealed that the application TikTok does affect cognitive functions. Following this we will suggest ways in which you can reduce your screen time such as enabling TikTok's screen time setting and what methods you can put in place to improve your cognitive functions.

1. Introduction

The prevalence of social media in society today cannot be understated, and its popularity and usage continues to grow over time (Ortiz-Ospina, 2019). As of 2019, Facebook, the most popular social media platform, had 2.3 billion users, followed by YouTube, WeChat and Instagram, with over a billion users (Ortiz-Ospina, 2019). In 2022, TikTok had 2.25 million active users in Ireland, making up 44% of the 5.1 million strong population at the time (Weckler, 2022).

TikTok was the most downloaded social media application in 2020 (Yeung, 2022). TikTok is a social media app based on short-form video content. It is available on Android and iOS devices, where it is primarily used, however recently it became available on Windows and iMac platforms.

The essence of TikTok is creating and sharing short videos for purposes such as entertainment or education. TikTok's unique selling point is that its short-form videos allow

users to create and share their created content (Roberti, 2023). Therefore, users believe they are in control of the content they consume. TikTok's target market is primarily composed of young people, where as of 2023, 34.9% of the platform's users are aged 18-24 (Iqbal, 2023).

Despite its popularity, TikTok has been the subject of scrutiny over how the platform treats user data. Lawmakers and advocates for digital privacy in the United States were concerned that TikTok was using user data for targeted advertisements, and in the interest of the Chinese government (The New York Times, 2020). An article published by The New York Times addressed the fact that TikTok harvests many types of user data, including location, browsing history and device information.

Although social media platforms continue to grow in popularity over time (Ortiz-Ospina, 2019), excessive social media usage has been found to have a negative impact on the mental health of users, as they become victims of "internet addiction" (yi Lin et al., 2016).

In this paper, the authors explore the impact of TikTok on students and investigate how students typically interact with the app.

2.1 Social media in society

2.1.1 What is social media?

"Social media" refers to digital platforms available to users online on the internet. The most common services associated with social media include encyclopaedias, blogs, social networking websites, media content sharing sites and virtual worlds. (Dewing, 2010). Social media has grown rapidly over the years, leading to considerable changes in social behaviours. In today's world, social media is a part of our daily routine (Ortiz-Ospina, 2019).

Social media has been suggested to have originated in the early 2000s with the creation of MySpace (Ortiz-Ospina, 2019). However, social media has existed for decades. In the late seventies, Jim Ellis and Tom Truscott introduced a global online chat service, which enabled users to post messages in the digital world for other internet users to see (Kaplan and Haenlein, 2010). Another recognizable networking service created before MySpace, a platform known as SixDegrees, was released in 1997 (Dewing, 2010).

Social media today can be seen as a way of interaction and communication that we did not have in previous years in society. There is no doubt that this new means of communication and interaction has altered the way in which we act and think in society. Before the introduction to social media, the only forms of media available to society was broadcasting media, such as newspapers, radio, and television (Miller, 2016). Nowadays, there exists a multitude of media forms. Examples include online gaming communities, social networking websites, online forums and blogs, where

each type of platform attracts different types of people (Kaplan and Haenlein, 2010). The majority of social media websites that exist today have been forced to undergo significant changes to keep their platforms relevant - it was not until 2011 that Twitter allowed its clients to upload pictures or videos on the platform (Ortiz-Ospina, 2019). Hence, social media is constantly changing, it can be challenging to keep up with the times, given how quickly social media evolves (Kaplan and Haenlein, 2010).

Social media is increasingly popular today because since its introduction it has constantly been evolving, just like the technological tools we use to engage with these platforms. Some technological improvements include, but are not limited to, the improvement of broadband, improvement of cellular devices, improvement of social media websites and reductions in the cost of software required to participate in social media (Dewing, 2010).

2.1.2 The popularity and reach of social media.

There are many social media platforms available today, such as Facebook, YouTube, Instagram, TikTok, WhatsApp, and Reddit. The popularity of these platforms has been on the rise over the past 5 years, and as of 2023, over 4.9 billion people are using social media platforms (Ruby, 2023). The three most popular platforms are Facebook, YouTube and WhatsApp, with 2.95 billion, 2.56 billion, and 2 billion users, respectively (Ruby, 2023).

A 2021 survey by the Pew Research Center found that YouTube and Facebook were the most popular social media platforms among adults over thirty, with 81% and 69% usage, respectively. Instagram, LinkedIn and Pinterest followed, with 40%, 30% and 30%, respectively. Regarding adults under thirty, Instagram was the most popular application with 71% usage. Snapchat followed closely at 65% and TikTok at 50% usage. These findings display the varying preferences for social media platforms among different age groups (Brooke and Anderson, 2021).

Some common factors that drive the popularity of these platforms include but are not limited to, entertainment, connection, marketing, shopping, and information (Ofcom, 2022).

Looking at entertainment first, users can create and view content posted by others, play games, and share videos and memes with others, all of which are forms of engagement that entertain. Connections are another key factor that has popularised social media as social media platforms provide a convenient and accessible way for people to communicate instantaneously. Regarding advertisers, the potential for marketing is endless with social media. Given that over 4.9 billion people use social media, these platforms provide an excellent outlet for advertisers (Kaur, 2021). This of course ties into online shopping when regarding the social media user. Improvements in algorithmic advertising have made social media platforms increasingly popular for online shopping, allowing for more accurate product

recommendations for users (Kim et al., 2021). Social media is also often used to facilitate the spread of information and news (Newman et al., 2020), although this has both positive and negative connotations. Positives include accessibility to a diverse range of social media users (Dobransky & Hargittai, 2012). Negatives include the ease of access to biased or inaccurate information (Woolley & Howard, 2016).

2.1.3 Impacts of social media on adolescents

The younger generation is more attracted to use social media websites as opposed to the older generation (Ortiz-Ospina, 2019). According to a 2019 study, roughly 73% of people under the age of twenty five were using Snapchat, while only 3% of people over sixty-five were using the application (Ortiz-Ospina, 2019). Social media provides young adults with a way to contact friends and family in different places around the world, access to useful information about future occupations, online groups with people who share similar interests as you, and relevant news (Siddiqui and Singh, 2016).

The world is no longer faced with communication obstacles like it was before the internet. Today, we can contact someone across the globe with the push of a button. This evolving and ever changing world of social media has led to adolescents growing up in a world where they are becoming antisocial, as they have less of a need to interact with people in real life (Amedie, 2015). As a result, false friendships and relationships can form, which can lead to psychological and emotional issues later in life (Amedie, 2015). Other downsides of social media use in young people include the risk of exposure to online predators, wasted time due to excessive social media usage, encountering inappropriate or dangerous content, and the risk of harm such as assault, abduction or burglary due to private personally identifying information being posted online (Siddiqui and Singh, 2016). Anxiety and depression can also be experienced by users who interact with social media, as the content they consume causes them to set unrealistic standards for themselves (Amedie, 2015). An example of where this could occur is Instagram, due to the edited photographs of models and celebrities which may cause a vulnerable user to suffer from body image issues.

Social media has opened a path for adolescents to engage and interact with one another from anywhere in the world. They can share news with one another, and post updates on their everyday lives (Dewing, 2010). To summarise, social media affects all aspects in our lives and although it can be a beneficial platform, safe practices and awareness need to be in place.

2.2 Social media and the brain

2.2.1 How does social media and technology affect the brain?

The brain adapts to its environment (Choudhury and Mckinney, 2013). That being said, the brain will change when it is exposed to social media, because social media

will adjust the environment that the brain and nervous system are accustomed to (Choudhury and McKinney, 2013). This constant change and evolution of the brain is due to neuroplasticity - where the brain and nervous system respond to different stimuli it encounters (Choudhury and McKinney, 2013).

Human interaction is good for your brain (Dodge et al., 2014). Having social interactions with other people may decrease your chances of illness and fatality (Dodge et al., 2014). Social encounters have been shown to slow down dementia advancement (Dodge et al., 2014). When a person interacts with someone else, they are engaged in a conversation. Whether they are gossiping about a person, or discussing their workload in college - they are conscious in that conversation, and they must be able to analyse the information being presented in the interaction, so that they can form a response (Dodge et al., 2014). With technology, there is less of a need to think about a response as they can think about it again and again (Dodge et al., 2014).

The overuse of screen time while using technology may affect your brain development (Small et al., 2022). A study conducted in 2018 which investigated children between the age of 8-12 and their brain development, the study revealed that the children who reported reading assisted in brain development and the children who were subjected to screen media had a decrease in brain activity (Horowitz-Kraus and Hutton 2018).

Brasington focuses on the influence social media has on the natural and mechanical rhythms of everyday life. Natural rhythms include the cycles of the sun and moon, a light flickering, or, in relation to human beings, the way in which we simply live i.e. respiration. Mechanical rhythms are things people actively do, such as attending a lecture, or going to school. He found that adolescents use social media in almost every aspect of their lives. Some of these aspects include using the toilet, when trying to fall asleep, and when consuming food. The concern of Brasington's study is that once the mechanical rhythms exceed the natural rhythms, long term effects can harm the individual (Brasington, 2020). An example would be a person becoming jet lagged when they travel across time zones, as their body clock has not adjusted to the differences in time zones. This may result in the individual suffering from mood swings, difficulty concentrating, and fatigue.

2.2.2 Social media, mental health and academic performance

Adolescents spend a lot of time using social media and since it is relatively new to the world, there is not sufficient enough information about the long term effects (Bashir and Bhat, 2017). Social media and depression work in opposite directions to one another meaning the way in which a person interacts online may have a significant role in the type of symptoms they develop (Baker and Algorta, 2016). Signs of depression can be caused by excessive use of mobile devices and it is recommended

that you establish boundaries and restrict yourself with your mobile device (Thoméé et al, 2011).

The impact of social media on mental health can be beneficial and damaging for a person. Positive effects include professional health information, help with managing mental health disorders, emotional support, and freedom of speech. Whereas, the damaging effects include media include depression, anxiety, poor sleeping quality, loneliness, fear of missing out, suicidal thoughts and body image issues (Sadagheyani and Tatari, 2021). In addition, adolescents may be subjected to cyberbullying and harassment if they spend too much time on social media, the aftermath of this issue could have negative effects on the adolescent as they may mimic the bullying as a form of revenge (Coyne and Stockdale, 2020).

The introduction of Facebook to college students had an adverse effect on their mental health. After the application was launched, an increase was seen in the number of students who were struggling with their mental health. Some suggested reasons for this increase include social behaviours such as drinking and drug use being promoted on the platform (Braghieri et al. 2022). Studies recommend monitoring females who are single, in education or have a depleted education, earn a low salary and who may have low self-esteem and who show egotistical behaviour to prevent harmful and addictive online involvement (Andreassen et al., 2017).

Social media can be seen as a risk to the development of young adolescents (Van Den Eijnden et al., 2018). Constantly refreshing social media overtime would cause adolescents to have a negative learning efficiency, as well as a limited attention span (Yang, 2022). Overuse of social media can cause a decrease in the adolescents grade (Talaue et al., 2018). The constant use of social media may cause someone to struggle with attention as they are not allowing their brain to switch off and relax in default (Small et al., 2022).

Prolonged usage of social media may affect the academic career of an adolescent (Yang, 2022). Studies suggest that schools and colleges should start encouraging the use of social media applications for education and not just amusement (Talaue et al., 2018). Another study suggests the institution should adapt to social media and become more involved online by establishing their own pages online which promote the institute and inform students about current events and academic dates to help reduce a set back in the students academic performance (Habes et al., 2018).

Regardless of the individual's sex or ethnic background, people who have an addiction to social media tend to have lower self-esteem and are not as satisfied with their real lives (Hawi and Samaha, 2017). Moreover, it can be hard to assess the extent of social media and mental health as it is constantly changing (Baker and Algorta, 2016).

2.3 TikTok and cognitive functions

2.3.1 How TikTok can affect sleep patterns and circadian rhythms.

Circadian rhythms are the body's internal time measurements. They are natural biological processes that help to regulate the human sleep-wake cycle, and are controlled by an internal 'body clock' located in the suprachiasmatic nucleus of the brain. External factors such as light exposure affect this 'body clock' (NIGMC, 2022). These rhythms allow the body to move in a phase of cycles (Cajochen, 2007).

Blue light from mobile devices and other screens potentially interrupts these rhythms and can harm a person's sleep pattern (Cajochen et al., 2011). This occurs because blue light is particularly effective at suppressing the production of melatonin in the human body, which plays an important role in the body's sleep-wake cycle. Blue light exposure at night from devices may therefore disrupt the circadian rhythm, interfering with sleep quality and duration (Wright et al., 2020).

Automatic social media usage has been associated with increased daytime fatigue, mediated by higher levels of cognitive arousal before sleep (Levenson et al., 2021). However, methods of relaxation before sleep, such as breathing exercises, improve the quality of sleep, whereas social media usage increases cognitive arousal, thus negatively impacting sleep hygiene (Wang & Scherr, 2022). Furthermore, TikTok's flow of content and features such as blocking the clock out so the user cannot see it on mobile devices can make it easy to lose track of time and potentially interfere with a person's circadian rhythms.

Learning and memory consolidation have been linked to sleep as highly important. Shorter sleep is associated with negative cognitive effects, poor academic performance, decreased mood, and substance use (Hershner, 2020). According to a study in sleep quality, duration and consistency, it was found that improved results related to longer and more routine sleeping, and sleeping in an improved fashion with a regulated sleeping routine would see a rise with grades for roughly two months before an exam. It is taking these measures that accounted for a 25% change in academic performance (Okano et al., 2019).

TikTok has been considered an end of day application (Wang and Scherr, 2022) with peak times ranging from 6am to 10 am and 7pm to 11pm (Singh, 2023). Viewing content at night-time on the application can result in wearying your brain and mind which overtime can cause daytime exhaustion and a poor sleep schedule (Wang and Scherr, 2022).

2.3.2 Mental health and addiction problems on TikTok.

Research carried out in China on adolescent students found that excessive TikTok usage is linked to memory loss, along with depression, anxiety and stress. The research also found that although more female participants used TikTok excessively,

the male participants showed more depression, anxiety, and stress than the female participants (Sha & Dong, 2021). The cognitive function of young people is considerably affected by social media in general. Social media usage may reduce an individual's ability to allocate their attention effectively, remain focused over prolonged periods, process and understand information, and relate to content emotionally (Gausby, 2015).

Mental health issues, such as stress and anxiety, have been linked to TikTok. Other issues such as social alienation, incorrect sleeping patterns, and vision problems (Qin et al, 2023). Adolescents who come from disadvantaged backgrounds and who struggle to communicate with others are more likely to develop an addiction to social media (Yang, 2022). The problematic nature of excessive social media usage can be attributed to the user attempting to preserve their cheerful emotions, which encourages them to continue to use the platform excessively. This enables the user to experience satisfaction and positive emotions repeatedly. Users may develop a warped sense of time as a result of constant social media usage, which may lead to the user becoming disengaged from reality and overly engaged in the online world (Qin et al, 2023). Research suggests that addiction on social media is more prominent in females, single, not as educated, those still in school and are at a younger age (Andreassen et al., 2017).

TikTok supports obsession as the user of the application can engage in video content which is entertaining and once they finish viewing that video they can view multiple videos which are similar and provide the user with the same satisfaction as watching the original video did (Brasington, 2020). Moreover, to promote user interaction social media applications use algorithms to display content which may not be necessarily precise (Yeung, 2022). During the covid pandemic students who were subjected to online learning were allocated more work than they would have been assigned when they were attending school normally. Students began to post cheats to pass exams and complete their assigned school work on the platform (Literat, 2021).

A study by Jargon investigating TikTok's Chinese counterpart, Douyin, found that the recommendations which the application tailors for the individual user triggers the "reward centres of the brain" as opposed to the general content. When the study focused on the brain activity of college students, it found the addiction areas in the brain were triggered when students watched content from the tailored recommendations. Following this, it was found that a number of students struggled to close the application and stop viewing content (Jargon, 2022).

Furthermore, TikTok provides the user with a personal preference tab known as the 'For You Page', which encourages addiction as the content being shared to the user is the content which they enjoy viewing (TikTok,2020). TikTok can be viewed as a flow experience - a state of addiction that a person may feel about a subject i.e. TikTok. In relation to a flow experience, they will want to continuously interact with the application, as it provides them with the ultimate satisfaction. Additionally, TikTok is

viewed as a compulsive and unrestrained problem, where constant overdoing may lead to damaging outcomes in the future. (Qin et al, 2023).

3. Methodology

In order to answer our research question, “How does TikTok affect the cognitive function of final year students of University of Galway?”, we will deploy a survey and interview fellow students of University of Galway.

The reason we have decided to do an online survey is because they are cost efficient, data can be easily stored and collected, and they can be accommodating for completion (Ball, 2019). There are less errors in gathering information with surveys (Glasow, 2005). We want to understand the attraction to TikTok, and the common purpose for deploying a survey is to investigate human behaviour (Ponto, 2015).

We will disperse the survey to fifty of our fellow students. Once we tally our survey results we will input them onto an excel spreadsheet and then we will save the data. To analyse our survey results, we will use the data analysis program Jamovi for relative frequencies and tables for our results.

The questions we will include in our survey are as follows;

1. What gender are you?

This information may become relevant when further analysis is completed.

2. How old are you?

More a general question, may become relevant when further analysis is completed..

3. Do you use TikTok?

This question will inform us whether the students use TikTok or not.

3. What device do you use to interact with TikTok?

This question will provide us with information on what devices the students use for TikTok.

4. What do you use the TikTok for?

This question will give us an idea of the main reason people use the application..

5. On a scale of 1-5 (1 being unentertained and 5 being terrific) would you rate the application?

This will show us the opinion of the application from the students..

6. What time of the day do you use TikTok?

This question will show us if the students use the application morning, noon or night time..

7. How long do you spend on TikTok each day ?

This question will inform us how long people use the application per day and we can average the daily hours from the students in our university.

We will conduct the survey on Tuesday 14th of March at 13:00 on the University of Galway campus.

After the survey is completed we will focus on the interview section of our research. The reason we have decided to do an in person interview is because interviews are helpful at acquiring a person's point of view (Rowley, 2012).

In addition, We will create an interview that will include five questions about social media and TikTok. We will interview fellow final year students on campus. We will disperse the interview to fifteen of our fellow students. Once we gather our interview results we will analyse the data and report our results.

The questions we will include in our interview are as follows;

1. Do you think social media is a useful tool for online learning?

This question will give us an insight on whether students agree with social media being a beneficial instrument to online learning.

2. Do you think social media has impacted the way humans interact with each other?

This question will give us an idea on what other students think about social media and we will get their opinion on how humans interact with each other online.

3. Why do you use TikTok?

This question will provide us with a glimpse of why people use TikTok.

4. Are there any trends or challenges that you can think of that have impacted society today?

This question will show us the different points of views from each individual student and what impact and impression they have received from their TikTok feed.

5. Do you think TikTok can affect your academic performance? And how?

This question will show us if students have had their academic performance affected by TikTok.

We will conduct the interview on Friday March 24th at 14:00 on the University of Galway campus.

4. Results

Below we have provided our results from both the survey and the interviews that we conducted.

4.1 Survey Results;

We created a survey to gather information about the user's experience with TikTok. Our survey instrument for this paper was a self-administered questionnaire. We designed the questions to gather information about the TikTok usage habits of our research subjects, such as their frequency of use, and their general opinion of the platform. We sent the survey to final year students of UG, the target group of our research. We surveyed fifty of our fellow classmates.

Below are our main findings.

Survey Plots

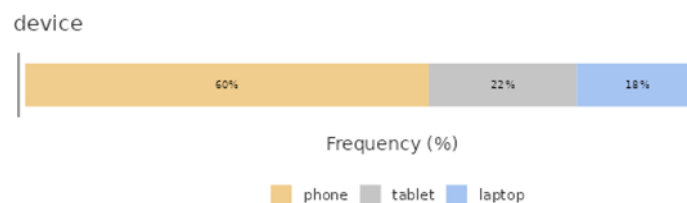


Figure 1: types of devices that the students use to engage in TikTok.

Our survey revealed that 60% out of the fifty students use TikTok on their mobile phones, 22% use tablets and 18% use their laptops.

Survey Plots

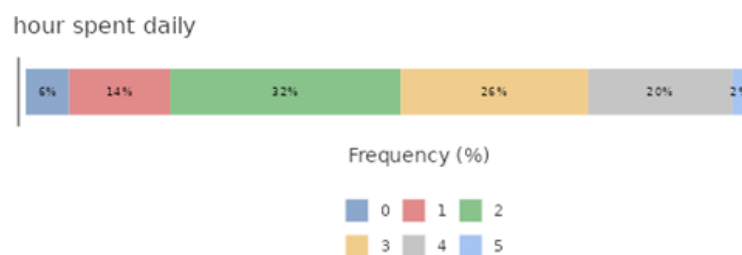


Figure 2: Total duration each student engages in the app everyday.

The plot above reveals that TikTok is most popularly used between two to four hours each day, with the highest percent being used for two hours everyday. Following this report, it was important to understand what time of the day students use the application, below is a frequency table of the time of day that students engage in the application.

Frequencies

| Frequencies of Time | | | |
|---------------------|--------|------------|--------------|
| Time | Counts | % of Total | Cumulative % |
| morning | 10 | 20.0 % | 20.0 % |
| night | 33 | 66.0 % | 86.0 % |
| throughout the day | 7 | 14.0 % | 100.0 % |

Figure 3: Frequency table of time of day students used the application.

The results above reveal that the most popular time which students interact with the application is night time. Next we looked at the reasons as to why people used the application. Figure four reveals our results

Frequencies

| Frequencies of Reasons | | | |
|------------------------|--------|------------|--------------|
| Reasons | Counts | % of Total | Cumulative % |
| Entertainment | 27 | 54.0 % | 54.0 % |
| Self-Help | 15 | 30.0 % | 84.0 % |
| education | 8 | 16.0 % | 100.0 % |

Figure 4: Frequency table of why the application is used.

The results reveal that the reasons why the students in University of Galway use the application is for entertainment, self-help and education, with entertainment being the main reason and being said by more than half the students surveyed. When asked to rate their enjoyment of application from 1-5 (1 being no enjoyment, 5 being very satisfied) , the most popular response was 5 closely followed by 4. From these results we can see that the application is enjoyed by the students with very little dissatisfaction from the application.

Survey Plots

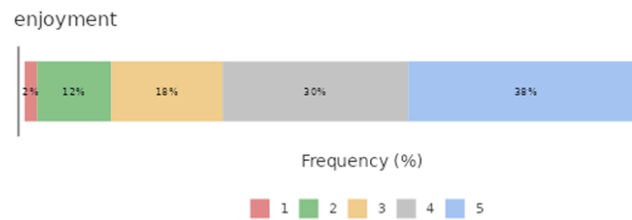


Figure 5: Student enjoyment scale.

Finally we viewed the data from the reasons why students use the application i.e entertainment, self-help and education and we categorised that by the students rate of enjoyment and their daily hours spent on the application.

Descriptives

| Descriptives | | | | | | | | |
|-----------------|---------------|----|---------|------|--------|-------|---------|---------|
| | Reasons | N | Missing | Mean | Median | SD | Minimum | Maximum |
| Daily | Entertainment | 27 | 0 | 2.52 | 3 | 1.156 | 0 | 4 |
| | Self-Help | 15 | 0 | 2.53 | 3 | 1.457 | 0 | 5 |
| | education | 8 | 0 | 2.13 | 2.00 | 0.835 | 1 | 4 |
| Enjoyment (1-5) | Entertainment | 27 | 0 | 4.19 | 4 | 0.879 | 2 | 5 |
| | Self-Help | 15 | 0 | 3.60 | 4 | 1.183 | 2 | 5 |
| | education | 8 | 0 | 3.50 | 3.50 | 1.512 | 1 | 5 |

Figure 6: Descriptives table looking at the breakdown of daily screen time and enjoyment with the reasons students have to use the application.

This table revealed that the average daily use was three hours. It shows that students who used the application for entertainment gave it a higher enjoyment report. Entertainment results overall averaged at 4.

4.2 Interview Results;

After our survey was completed, we decided to gather more relevant information on social media and TikTok. We decided to interview fifteen final year students. We used convenience sampling to select the ten participants for our interview. The interview consisted of a series of questions about social media and TikTok. The following questions which we included in our interview were “Do you think social media is a useful tool for online learning?”, “Do you think social media has impacted the way humans interact with each other?”, “Why do you use TikTok?”, “Are there any trends or challenges that you can think of that have impacted society today?”, “Do you think TikTok can affect your academic performance? And how?”.

The interview was conducted Friday March 24th at 14:00 on the University of Galway campus, and it took approximately 10 minutes per candidate to complete.

The key findings and insights of the interviews were as follows:

When questioned about the potential of social media and learning in an online environment one participant responded saying;

"I think social media can be a useful tool for learning online. Social media allows educators and students to interact with one another outside of school hours. Students can communicate online on social media applications such as snapchat or Instagram. As well as that students can help one another online after college in the evening."

While another student expressed how *"students can gain experience in future roles in social media. Again, yes I think social media is a very useful tool for online learning."*

Social media and online learning had positive reactions with all participants being eager to learn in an online environment. When asked whether the participant thought social media influenced the way that humans interact with each other. One person said;

"Social media allows people to stay in touch with each other; it is a relatively new way to communicate with one another. Applications such as Tinder or Hinge allow you to meet new people and find potential love interests. TikTok and YouTube provide instant entertainment online which provides you with instant amusement."

Some students expressed FOMO "fear of missing out" from excessive social media with one male participant saying;

"Even though social media is a wonderful and exciting way to interact with other people online, it can also be quite overwhelming. I have found myself to have social anxiety every once in a while. I also have found that sometimes I have FOMO when I see my friends out socialising on their Instagram and Snapchat stories."

A common response from all the students questioned were that they mainly used TikTok for entertainment purposes with one student saying *"I find TikTok is a nice way to take a break from my very busy student life and relax"*. When asked "Are there any trends or challenges that you can think of that have impacted society today?", one participant responded with;

"Yes, there have been a lot of trends on TikTok which have impacted society today. I think body positivity has become a big topic in recent years. TikTok is a great application to promote body positivity, we come in all shapes and sizes, the whole atmosphere is inspirational and wholesome."

Another pointed their attention towards the awareness that has been put in place for mental health;

“Mental health awareness has become a prominent theme shared all over the TikTok community, I am all for it, I am a big advocate for mental health. I think it is a very important issue and it is comforting knowing I am not alone and that it is normal to not feel okay and to reach out for help.”

Other participants drawing attention towards the environment;

“Content about being sustainable has been all over my TikTok lately which I think has definitely impacted society lately. Sustainability is an important issue as we only have one planet, sustainable content helps spread awareness on reducing our impact on the planet”

There were a variety of themes that appeared on the platform which students expressed passion and encouragement over. The last question we asked was in relation to TikTok and learning and if they think their studies have been affected from using the application. One participants response was;

“Yes I do, I think all types of social media can affect your academic performance especially TikTok. I have had many nights where I have found myself on the verge of sleeping but instead I have aimlessly scrolled through my TikTok, next thing its 3am and I have a lecture at 9am, then I either not go to my lecture or I am half asleep in the class. I also have found that sometimes I find videos of people who society deem as really attractive and it depresses me as I will never achieve that standard of attractiveness. TikTok is a great distraction but that is what it is, a distraction. You could spend hours doing absolutely nothing but watching TikTok videos. One time I accidentally spent four hours on the couch watching TikTok videos.”

While another participant replied with *“Yes I missed a deadline for an essay before because I watched TikTok instead of doing my work”*. Both students seemed to have had their academic performances affected by the use of the TikTok application. This was a common response from all participants involved in the interview.

5. Discussion

The aim of this study was to investigate if TikTok affected the cognitive function of students in the University of Galway. TikTok has become one of the most downloaded applications on the internet and is used by millions everyday to share and intake content. This is one of the reasons we decided as a team to research it. This section is designed to analyse the finds of this paper and to identify gaps in the existing research. As we began our investigation we expected to find that TikTok had a strong influence on the cognitive function of young people and students.

From our research we found social media has a big impact on society and the way which we interact with each other. Following this, the impacts of social media can be beneficial to a person as they can look up healthcare advice, counselling and guidance with their mental health, and control in their speech but it can also cause body shame, interrupted sleep and a

series of negative thoughts and emotions such as stress, nerve, depression (Sadagheyani and Tatari, 2021).

5.1 TikTok features that can help

Fortunately for mobile phone users, TikTok seems to be aware of the endless hours which people can spend on the application. To help prevent this they have included extra features which are available on mobile phone devices.

These features include;

Screen time breaks which will remind you to take a break when you pass that time.

Sleep reminders which will inform you if you pass the time set to sleep.

Daily screen time reminders which will inform you when you have reached your daily screen time.

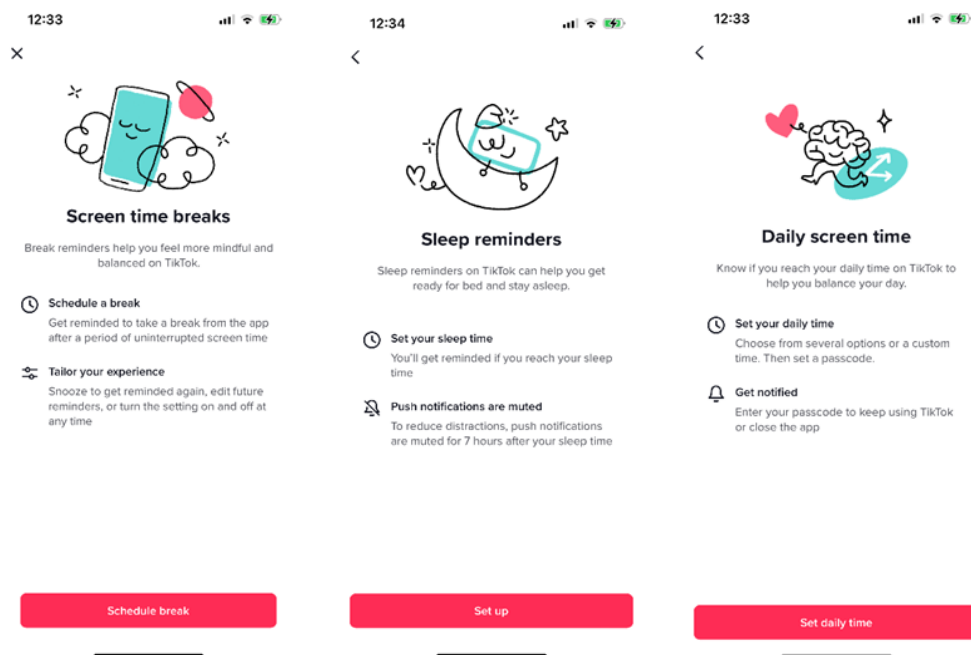


Figure 7: Positive features on TikTok mobile phone devices.

6. Conclusion

To conclude, social media is a digital platform which allows people to interact with one another online. It holds a strong influence in society at the moment and from our investigation it looks like it will only become more and more prevalent in our lives. Although, there is a multitude of positive impacts that is entailed with social media examples being; online communication, online learning, building a building and online support. There are also negative effects of social media such as fake news, false personas and online bullying. Nowadays in universities, social media is used to communicate. Students can communicate individually or in group chats. Additionally it is used as a platform to announce events and important dates held by the university.

In this paper we have investigated the social media application TikTok. The aim of this study was to analyse the cognitive effects of TikTok and what potential risks overuse of the application might have on students. Since TikTok is still a relatively new application there is not sufficient information on the internet about long term impacts from using the application. This being said we would recommend further investigation on the application in the next 5 - 10 years when there is more relevant information about the application along with further evolutions in social media. Moreover, TikTok is an extremely successful application and has an influence over the world of young people. The application needs to be continually researched and investigated. Even though TikTok has been extremely successful in the previous years and has been a top downloaded application in 2020, 2021 there is still very little information and investigations about it (Yeung, 2022).

Bibliography:

Auxier, Brooke, and Monica Anderson. "Social media use in 2021." *Pew Research Center* 1 (2021): 1-4.

Adrian Weckler, 2022, *TikTok is catching up on Instagram and Facebook with its Irish subscriber base*, Irish Independent

Amedie, Jacob. "The impact of social media on society." (2015).

Alyson Gausby, 2015, *Attention spans*, Consumer Insights, Microsoft Canada

Andreassen, Cecilie Schou, Ståle Pallesen, and Mark D. Griffiths. "The relationship between addictive use of social media, narcissism, and self-esteem: Findings from a large national survey." *Addictive behaviors* 64 (2017): 287-293.

Brasington, Andrew. "Social Media Influences our Organic Rhythms in the Context of Neoliberal Capitalism: An Exploration into Performative Consumption Through TikTok." *The Owl—Florida State University's Undergraduate Research Journal* 11.1 (2020): 29-37.

- Baroness Susan Greenfield: Society should wake up to harmful effects of internet. (2010, September 15). The Telegraph. Retrieved from <http://www.telegraph.co.uk/technology/internet/8002921/Baroness-Susan-Greenfield-society-should-wake-up-to-harmful-effects-of-internet.html>
- Braghieri, Luca, Ro'ee Levy, and Alexey Makarin. "Social media and mental health." *American Economic Review* 112.11 (2022): 3660-3693.
- Bashir, Hilal, and Shabir Ahmad Bhat. "Effects of social media on mental health: A review." *International Journal of Indian Psychology* 4.3 (2017): 125-131.
- Baker, David A., and Guillermo Perez Algorta. "The relationship between online social networking and depression: A systematic review of quantitative studies." *Cyberpsychology, Behavior, and Social Networking* 19.11 (2016): 638-648.
- Ball, Helen L. "Conducting online surveys." *Journal of human lactation* 35.3 (2019): 413-417.
- Christian Cajochen, 2007, *Alerting effects of light*
- Christian Cajochen, Sylvia Frey, Doreen Anders, Jakub Spati, Matthias Bues, Achim Pross, Ralph Mager, Anna Wirz-Justice, Oliver Stefani, 2011, *Evening exposure to a light-emitting diodes (LED)-backlit computer screen affects circadian physiology and cognitive performance*
- Choudhury, Suparna, and Kelly A. McKinney. "Digital media, the developing brain and the interpretive plasticity of neuroplasticity." *Transcultural psychiatry* 50.2 (2013): 192-215.
- Chancellor, Stevie, and Munmun De Choudhury. "Methods in predictive techniques for mental health status on social media: a critical review." *NPJ digital medicine* 3.1 (2020): 43.
- Damian Roberti, 2023, *What is TikTok's unique selling point? And what are TikTok's competitive advantages?*
- Daniel Ruby, 2023, *Social Media Users In The World — (2023 Demographics)*
- Daesik Kim, Dongwon Lee and Sangchul Hyun, 2021, *The impact of algorithmic recommendation on social media shopping*
- Dewing, Michael. *Social media: An introduction*. Vol. 1. Ottawa: Library of Parliament, 2010.

- Dodge, Hiroko H., Oscar Ybarra, and Jeffrey A. Kaye. "Tools for advancing research into social networks and cognitive function in older adults." *International psychogeriatrics* 26.4 (2014): 533-539.
- Esteban Ortiz-Ospina, 2019, "The rise of social media". Published online at OurWorldInData.org. Retrieved from: 'https://ourworldindata.org/rise-of-social-media' [Online Resource]
- Glasow, Priscilla A. "Fundamentals of survey research methodology." *Retrieved January 18 (2005): 2013.*
- Horowitz-Kraus, Tzipi, and John S. Hutton. "Brain connectivity in children is increased by the time they spend reading books and decreased by the length of exposure to screen-based media." *Acta paediatrica* 107.4 (2018): 685-693.
- Hawi, Nazir S., and Maya Samaha. "The relations among social media addiction, self-esteem, and life satisfaction in university students." *Social Science Computer Review* 35.5 (2017): 576-586.
- Habes, Mohammed, et al. "The relationship between social media and academic performance: Facebook perspective." *Int. J. Inf. Technol. Lang. Stud* 2.1 (2018): 12-18.
- Jennifer C. Levenson, Ariel Shensa, Jaime E. Sidani, Jason Brian Colditz, Brian A. Primack, 2021, *The association between social media use and sleep disturbance among young adults*
- Jargon, Julie. "TikTok Brain Explained: Why Some Kids Seem Hooked on Social Video Feeds." WSJ. URL: <https://www.wsj.com/articles/tiktok-brain-explained-why-some-kids-seem-hooked-on-social-video-feeds-11648866192> (accessed 6.6. 22) (2022).
- Kerry Dobransky, 2012, *Inquiring minds acquiring wellness: Uses of online and offline sources for health information*
- Kenneth P. Wright, Andrew W. McHill, Brian R. Birks, Brandon R. Griffin, Timo Rusterholz, Eric D. Chinoy, 2020, *Entrainment of the human circadian clock to the natural light-dark cycle*
- Kamalpreet Kaur, 2021, *The impact of Social Media on Consumer buying behaviour*
- Kaplan, Andreas M., and Michael Haenlein. "Users of the world, unite! The challenges and opportunities of Social Media." *Business horizons* 53.1 (2010): 59-68.

- Kana Okano, Jakub R Kaczmarzyk, Dave Neha, John D. E. Gabrieli, Jeffrey C. Grossman, 2019, Sleep quality, duration, and consistency are associated with better academic performance in college students.
- Liu yi Lin, Jaime E. Sidani, Ariel Shensa, Ana Radovic, Elizabeth Miller, Jason B. Colditz, Beth L. Hoffman, Leila M. Giles, and Brian A. Primack, 2016, *Association between Social Media Use and Depression among U.S. Young Adults*
- Literat, Ioana. "'Teachers act like we're robots': TikTok as a window into youth experiences of online learning during COVID-19." *AERA open* 7 (2021): 2332858421995537.
- Lara, Rachel S., and Rebecca Bokoch. "Cognitive functioning and social media: Has technology changed us?." *Acta psychologica* 221 (2021): 103429.
- Mansoor Iqbal, 2023, *TikTok Revenue and Usage Statistics*
- Miller, Daniel, et al. *How the world changed social media*. UCL press, 2016.
- Mao, Jin. "Social media for learning: A mixed methods study on high school students' technology affordances and perspectives." *Computers in Human Behavior* 33 (2014): 213-223.
- McGrath, Cormac, Per J. Palmgren, and Matilda Liljedahl. "Twelve tips for conducting qualitative research interviews." *Medical teacher* 41.9 (2019): 1002-1006.
- Nic Newman, Richard Fletcher, Antonis Kalogeropoulos, David A. Levy, Rasmus Kleis Nielsen, 2020, *Reuters Institute digital news report*
- National Institute of General Medical Sciences, 2022, *Circadian rhythms fact sheet*
- Ofcom, 2022, *Online Nation Report*
- Peng Sha & Xiaoyu Dong, 2021, Research on Adolescents Regarding the Indirect Effect of Depression, Anxiety, and Stress between TikTok Use Disorder and Memory Loss
- Ponto, Julie. "Understanding and evaluating survey research." *Journal of the advanced practitioner in oncology* 6.2 (2015): 168.
- Rosen, Larry D., L. Mark Carrier, and Nancy A. Cheever. "Facebook and texting made me do it: Media-induced task-switching while studying." *Computers in Human Behavior* 29.3 (2013): 948-958.

- Rowley, Jennifer. "Conducting research interviews." *Management research review* 35.3/4 (2012): 260-271.
- R Core Team (2021). *R: A Language and environment for statistical computing*. (Version 4.1) [Computer software]. Retrieved from <https://cran.r-project.org>. (R packages retrieved from MRAN snapshot 2022-01-01).
- Samuel C. Woolley and Philip N. Howard, 2016, *Political communication, computational propaganda and autonomous agents*
- Siddiqui, Shabnoor, and Tajinder Singh. "Social media its impact with positive and negative aspects." *International journal of computer applications technology and research* 5.2 (2016): 71-75.
- Shelley Hershner, 2020, Sleep and academic performance: measuring the impact of sleep
- Small, Gary W., et al. "Brain health consequences of digital technology use." *Dialogues in clinical neuroscience* (2022).
- Singh, Chandraveer. "What Is the Best Time to Post on TikTok in 2023?" *SocialPilot*, 20 Mar. 2023, <https://www.socialpilot.co/blog/best-time-to-post-on-tiktok#:~:text=According%20to%20our%20research%2C%20Tuesday%2C%20Thursday%2C%20and%20Friday>.
- Sadagheyani, Hassan Ebrahimpour, and Farin Tatari. "Investigating the role of social media on mental health." *Mental Health and Social Inclusion* 25.1 (2021): 41-51.
- Stockdale, Laura A., and Sarah M. Coyne. "Bored and online: Reasons for using social media, problematic social networking site use, and behavioral outcomes across the transition from adolescence to emerging adulthood." *Journal of adolescence* 79 (2020): 173-183.
- The New York Times, 2020, *TikTok's Data Collection: What We Know and What's Next*
- TikTok, "Privacy and Settings." <https://www.tiktok.com/setting?lang=en>. Mobile
- The jamovi project (2022). *jamovi*. (Version 2.3) [Computer Software]. Retrieved from <https://www.jamovi.org>.
- Thomée, Sara, Annika Härenstam, and Mats Hagberg. "Mobile phone use and stress, sleep disturbances, and symptoms of depression among young adults-a prospective cohort study." *BMC public health* 11.1 (2011): 1-11.

Talaue, Gilbert M., et al. "The impact of social media on academic performance of selected college students." *International Journal of Advanced Information Technology* 8.4/5 (2018): 27-35.

TikTok (2019) *How Tiktok recommends videos #ForYou*, Newsroom. TikTok.
Available at:
<https://newsroom.tiktok.com/en-us/how-tiktok-recommends-videos-for-you>

Van Den Eijnden, Regina, et al. "The impact of heavy and disordered use of games and social media on adolescents' psychological, social, and school functioning." *Journal of behavioral addictions* 7.3 (2018): 697-706.

Wang, Kexin, and Sebastian Scherr. "Dance the night away: How automatic TikTok use creates pre-sleep cognitive arousal and daytime fatigue." *Mobile Media & Communication* 10.2 (2022): 316-336.

Woods, Heather Cleland, and Holly Scott. "# Sleepyteens: Social media use in adolescence is associated with poor sleep quality, anxiety, depression and low self-esteem." *Journal of adolescence* 51 (2016): 41-49.

Yeung, Anthony, Enoch Ng, and Elia Abi-Jaoude. "TikTok and attention-deficit/hyperactivity disorder: a cross-sectional study of social media content quality." *The Canadian Journal of Psychiatry* 67.12 (2022): 899-906.

Yang, Ziyi. "Why Adolescents Are Addicted to Social Media." *Journal of Education, Humanities and Social Sciences* 8 (2023): 1430-1436.