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**EXPLORING THE RELATIONSHIP BETWEEN
MOBILE ADDICTION, INTERPERSONAL
RELATIONSHIP, AND ACADEMIC BEHAVIOR
AMONG YOUNG ADULTS IN TERTIARY
INSTITUTIONS**

**¹Chan Yuen Fook, Suthagar Narusaman,
Norazah Abdul Aziz,
Sharifah Muzlia Syed Mustafa & Cheong Tau Han**
Faculty of Education, Universiti Teknologi MARA(UiTM),
Malaysia

¹Corresponding author: yuenfook@uitm.edu.my

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ABSTRACT

Purpose – Smartphones have become part and parcel of life in the 21st century. Since there has been limited research exploring the relationship between mobile addiction, interpersonal relationship, and academic behaviour among young adults in tertiary institutions, the present study has embarked on an exploration of the relationship between these three variables in the Malaysian higher education context.

Methodology – A descriptive correlational research design was employed to collect and analyse the data, which came from a total of

150 young adults who responded to an online Google form distributed through a WhatsApp link. The items in the questionnaire were adapted from various doctorate studies. The data were analysed using descriptive and inferential statistics such as the mean and standard deviation, correlation, and multiple regression.

Findings – The study found that young adults in tertiary institutions in Malaysia experienced a case of moderate mobile addiction. The results also established that the three variables, namely mobile addiction, interpersonal relationship, and academic behaviour, were interrelated. The findings revealed that interpersonal relationship has positively contributed to the variance of academic behaviour, while mobile addiction has negatively impacted young adults' academic behaviour in tertiary institutions.

Significance – The findings have provided valuable insights into how to help facilitate the monitoring of disruptive mobile usage among young adults in tertiary institutions.

Keywords: Academic behaviour, young adults, tertiary institutions, higher education, interpersonal relationship, mobile addiction, smartphone use.

INTRODUCTION

The advancement of information and communication technology (ICT henceforth) has brought significant changes to the world, particularly in connecting people, enabling seamless communication, and gaining access to information easily. The merging of communication technology, digital technology, and artificial intelligence have blurred the lines between the physical, digital, and biological spheres, which to a great extent has led to the improvement in the quality of life for most people (Aravind et al., 2019). The impact of these developments has become very substantial because technological devices or tools such as handheld communication and entertainment devices, mobile phones (inclusive of smartphones), and computers have undoubtedly become very much an integral part of our daily lives (Nizar et al., 2019).

As a wireless communication device, mobile phones have evolved alongside other technologies to do more than just make or receive phone calls and text messages. As exemplified by its name,

smartphones are now capable of numerous advanced functionalities. It is used for capturing, editing, and storing images and videos, recording and playing audio and music, accessing the internet, sending and receiving instant messages and emails, connecting to social media platforms, tracking physical activities and health-related information, live streaming of webinars or meetings, virtual banking, and many more. Considering their many benefits and the convenience they provide, mobile phones have become ubiquitous in our daily life to the point of being described as ‘an extra limb’ by the HuffPost’s Executive Lifestyle Editor Lori Leibovich (“Smartphone Addiction,” 2013).

Problem Statement

The increased misuse of the smartphone among young adults today are of serious concern to the public, parents, and educators. However, studies examining the relationships between media use and adolescents’ academic performance have yielded mixed outcomes. On the one hand, the internet and media use serve as a vital source of educational enrichment to help improve academic performance. Still, on the other hand, recent studies have suggested that excessive use of the internet and media, especially for non-educational purposes, can have adverse effects on academic performance (Volungis et al., 2020; Weaver et al., 2013). Numerous research findings have suggested that the enhancement of academic performance and cognitive skills development are achieved through the moderate use of either computer games, the internet or media. Meanwhile, excessive use had resulted in contradictory outcomes (Amez & Baert, 2020; Volungis et al., 2020; Dayapoglu et al., 2016).

A study on the relationship between smartphone use and academic performance conducted by Celikkalp et al. (2020) presented slightly different, but interesting findings. The results suggested that smartphone use for learning tasks was positively correlated to better academic performance; however, excessive or non-use was negatively related to academic performance. Other studies have indicated that exposure to media content on smartphones had a strong influence on young adults’ academic behaviours and interpersonal relationship (Volungis et al., 2020; Weaver et al., 2013)

In an era where smartphones are fast becoming, if not already an indispensable device in our daily life, there has been heightened interest among individuals and stakeholders as they become

increasingly concerned about the possible link between smartphone use and its effects on the different aspects of life, particularly in young adults' academic and personal life. Although a number of studies have investigated the relationship between media use and academic performance, not many have looked into the correlation between smartphone use by young adults and their academic performance and interpersonal relationship. This, however, is the particular focus area of investigation in the present research. Given the inconclusive findings of existing studies, there is a need to study the variables affecting the relationship, especially in the context of the young adults in the local Malaysian higher education system. It is hoped that the findings of this current study, in the context of its application of Bandura's social learning theory, displacement theory and the U & G approach, will be able to shed some light on our understanding of the impact of smartphone use on young adults' academic behaviours and interpersonal relationship.

LITERATURE REVIEW

Theoretical Framework

The theoretical frameworks referred to in this quantitative study were Bandura's social learning theory (Bandura, 2002), displacement theory (Valkenburg & van der Voort, 1994) and the U & G approach (Katz et al., 1974). In examining the relationship between media addiction and young adults' academic behaviour and interpersonal relationship, embracing theoretical frameworks that encompassed multiple perspectives would provide richer and more in-depth insights than just from the lens of a single theory. Since media is ubiquitous, its influence on young adults is multidimensional and changeable, given the transitional period of adolescence which is often marked with the intense exploration and construction of gender identity (Arnett, 1994). Thus, an examination of the relational influence of media on adolescents is better understood from a multidisciplinary perspective rather than just from a single perspective.

U & G Approach

The approach of uses and gratifications (U&G) has long been used to study how people use media. Katz et al., (1974) described the U&G approach to media studies as "(1) the social and psychological origins of (2) needs, which generate (3) expectations of (4) the

mass media and other sources, which lead to (5) differential patterns of media exposure, resulting in (6) need gratifications and (7) other consequences, perhaps mostly unintended ones” (p. 20). This present study has adopted the U&G approach to identify the social and psychological origins of social media use among young adults in institutions of higher education in Malaysia. It was aimed at understanding the differential patterns of their social media use, resulting in gratifications and potential social media addiction, and other possible consequences such as changes in academic behaviour and interpersonal relationship.

Previous research has examined the psychological antecedents of internet addiction, such as shyness (Huang & Leung, 2009), loneliness (Ghassemzadeh et al., 2008; Odaci & Kalkan, 2010), alienation (Huang & Leung, 2009), self-esteem (Ghassemzadeh et al., 2008), and depression (Cheung & Wong, 2011). To emphasise the social features of social media, this present study sought to further explore the social antecedents that might be responsible for triggering mobile addiction. In light of the review of the previous literature, this study has aimed at investigating the potential relationship between mobile addiction, interpersonal relationship and academic behaviour among young adults in institutions of higher learning in Malaysia.

Social Learning Theory

Albert Bandura’s social learning theory provides a theoretical framework in understanding the influence of media content on young adults’ aggressive behaviours. Social learning theory posits that these negative social behaviours were acquired through observation, modelling, and imitation (Bandura, 2002; Bandura et al., 1963). The theory has assumed that behaviours could be affected by the social and environmental cues operating in a given situational context and that the learning of new behaviours was the outcome of observing the behaviours of others, and coding the observed information in memory. Thus, it has been suggested that aggressive behaviours as portrayed in the media content of smartphones could have been stored in the young adults’ memories and possibly replicated should the observations of bold characters continued consistently. Although most studies about video games have focused on their influence on aggression, very few highlighted the advantages of non-violent video games. Studies have linked playing video games to greater spatial and visual perceptual skills, namely hand and eye coordination (Subrahmanyam & Greenfield, 2001) and improved motor skills, visual attention,

ability to read images, spatial skills, and learning skills (Gee, 2003). Playing non-violent video games also had the potential to improve adolescents' pro-social behaviour by increasing social interaction with family members and with friends (Colwell et al., 1995).

Media Displacement Theory

Media displacement theory has postulated that people had limited time and attention span, and partaking in one communication activity, would reduce one's ability to participate in others (Xie, 2016). In other words, time spent on media use would displace time for other activities such as academic activities (i.e. reading and studying), creative activities (such as free play and crafting) and physical activities (such as sports and hiking) (Hofferth, 2009; Neuman, 1995; Xie, 2016). In this regard, media displacement theory shared a similar perspective with the reduction hypothesis proposed by Valkenburg and van der Voort (1994). The hypothesis has suggested that the unique nature of media would serve as an inhibitor to the users' intellectual processing, resulting in poor academic performance. Media in this context includes online entertainment and social networking, such as Facebook, YouTube, Instagram, Tik Tok and Emails. According to both the theory and hypothesis, excessive use of media can affect students' academic performance by displacing other activities crucial to their academic development, such as reading and studying, getting sufficient rest and physical health activities. This postulate has been supported in a study by Shann (2001), who found that media use of up to 10 hours per week had negatively affected the academic performance of adolescents. In contrast, minimal media use has not necessarily suggested a threat to academic performance since the amount of time-displaced might be insignificant compared to the amount of time needed for educational activities (Hofferth, 2010).

The adverse effect of media use is not only limited to adolescents' academic performance, but also extends to their pro-social behaviour. It has been suggested that overdependence on media use could negatively affect adolescents' school attendance and relationships with teachers, parents, and peers. For example, several studies have found that adolescents who used media more frequently were more likely to develop low self-esteem, increased social isolation, inability to relate to others, and media overdependence (Hofferth, 2010; Lee & Peng, 2006; Subrahmanyam, Greenfield, Kraut, & Gross, 2001). Therefore, from the standpoint of media displacement theory, it could be explained that the more time adolescents spent on non-academic

activities, such as accessing media, the less time they would spend on productive activities, such as reading, studying, sports, sleep, and pro-social behaviour.

Conceptualising the Research Constructs of the Study

The Mobile Phone

Mobile phones are an essential tool for adults and an equally important tool for adolescents and young adults, including students enrolled in tertiary institutions. Born during a time when digital technology has advanced by leaps and bounds, young adults between the ages 13-25 years (IPPBM, 1999) have been exposed to technological devices from a young age and appeared to have apparent ease, confidence, and familiarity navigating multiple devices (Nguyen et al., 2020). This has earned young adults the label ‘digital natives’¹ (Donnie et al., 2018). In one of their studies, Park and Lee (2012) reported that the usage of the internet and smartphones among university students had expanded dramatically in recent years. Students were not only using it to communicate and foster relationships among family members and peers (Auter, 2007), but they were also using it for learning purposes, such as group discussions via instant messaging applications, accessing notes on learning management systems, or just simple information search. The classrooms in higher education have been growing increasingly diverse, and the inclusion of technology has become imperative to provide a responsive learning environment for learners to optimise their potential (Awang-Hashim et al., 2019). Therefore, the inclusion of technology and the use of mobile phones in university classrooms have become indispensable. However, many universities had previously tried to curtail the use of smartphones during class hours, considering it as a disruptive use of technology during the teaching learning process. Nevertheless, the smartphone’s functionality and role, particularly in e-learning, have become increasingly important and could no longer be denied (Wali & Omaid, 2020).

Mobile Addiction

Since not all university students are equipped with the knowledge and awareness of using technology effectively and responsibly, they are the most vulnerable to the harmful effects of excessive exposure to

technological devices. Studies have revealed the disruptive impact technological devices have on one's life (Dian et al., 2020), and the use of mobile phones has been reported to be a double-edged sword, particularly to youths (Park & Lee, 2012). A study conducted by Chandrasena et al. (2005) found that even though smartphone usage could be beneficial to youths, there were also downsides to overusing it. Irresponsible overuse of mobile phones among college students would reduce their attention during the class lecture, lead to billing issues, their forming dangerous driving habits, and eventually causing mobile phone addiction (Hiscock, 2004; Lepp et al., 2014). Other adverse effects resulting from mobile phone misuse during class included the following: reduced concentration on lessons and tasks, as well as decreased ability to grasp information during lectures (Ehrenberg et al., 2008). Apart from that, addiction to mobile phones has been found to negatively impact student social skills such as face-to-face communication (Pierce, 2009) and interpersonal relationships. It might lead to mental and physical disorders (Thomee et al., 2011) and could also affect their academic behaviour.

Billieux (2012) added that mobile phone addiction could harm a person's social life, behaviour, and emotions. Besides that, it could also cause wrist pain, fatigue, poor eyesight, anxiety, sleep disorders, and even worse, when using a mobile phone while driving could cause accidents (Lee et al., 2014; "Signs and Symptoms," n.d.; Walsh et al., 2008). All these problems could occur due to the failure to self-regulate mobile phone use until it could become a danger to oneself and others. Kim et al. (2014) reported that 43.4 percent of mobile phone addiction was the result of the average daily use of the smartphone device. In other words, the longer an individual spends time on a mobile device, the more likely he/she is to develop an addiction and dependence on it.

Mobile Addiction and Interpersonal Relationships

An individual who experiences mobile addiction tends to be extra sensitive to interpersonal relationships and will experience more negative emotions than non-addicts. Research conducted by Przybylski and Weinstein (2012) confirmed that mobile addiction was closely related to negative emotions, such as depression and anxiousness. Other previous studies have also found that people with high anxiety or depression frequently avoided face-to-face conversations as they found interpersonal communication, with its subtle conversational nuances, challenging to negotiate. For example, the study by Babadi-

Akashe and Zamani (2014), which was a study on the mental health and mobile phone addiction among university students in Iran, has revealed that students addicted to mobile phones were “affected with depressive disorder (17.30%), obsessive-compulsive disorder (14.20%), and interpersonal sensitivity (13.80%)” (p. 93). Rosen (2011) discovered that young adults addicted to their mobile phones displayed narcissistic behaviour and had problems engaging in interpersonal relationships. Volungis et al. (2020), based on their study of undergraduates, also reported that students with a higher level of indulgence in their smartphones displayed social and emotional distress and neuroticism. In another study involving young adult students, Celikkalp et al. (2020) found that scores in communication skills dropped as addiction scores increased. It is difficult to establish any kind of relationship without good communication skills. Hence, it is evident that the literature has established an underlying connection between mobile phone addiction and interpersonal relationship that often leads to various forms of negative emotions or relationship problems.

Mobile Addiction and Academic Behaviour

Additionally, a negative relationship between mobile addiction and students’ academic performance was also reported in numerous studies. Kibona and Mgaya (2015) found a negative relationship between mobile addiction and students’ academic performance among Tanzanian students regardless of age, gender, and marital status. These findings concur with the results in the study by Albarashdi et al. (2016), who identified mobile phone addiction as a side-effect which could contribute to students’ negative academic performance. According to Albarashdi et al. (2016), there were two main reasons causing students to become mobile phone addicts. The first one was due to their over-reliance on mobile phones as a way to avoid loneliness. Secondly, most device manufacturers’ marketing strategy deliberately targeted these young adults in their commercial ads. Some of them even cashed in on popular singers or famous international brands such as Blackpink as their brand ambassadors to promote their smartphones. Besides that, these manufacturers also competed against each other through their merchandise, and were driven to produce the most updated smartphone versions and applications to attract young people. The growing obsession with mobile devices, particularly among generation Z and the digital natives, has prompted researchers to suggest the propagation of meaningful and fun activities targeted at youths, such as organising fun runs and sports events in order to divert

their attention from the mobile phone obsession (Albarashdi et al., 2016). Much needs to be done, and initiatives from the government and stakeholders are imperative if we wish to curb mobile phone addiction that will affect young adults' academic behaviour in tertiary institutions. This also requires instilling among the younger adults and those more susceptible, to an awareness of mobile phone addiction and to help them become more responsible and thus recognize the appropriate use of mobile phones in daily life. Therefore, the present study has considered it essential to first explore the current situation of mobile phone addiction among young adults in institutions of higher learning in Malaysia before deliberating further actions to address the problem.

Mobile Addiction, Interpersonal Relationship and Academic Behaviour

According to the Smartphone User Persona Report (Vserv, 2015), smartphone users in Malaysia spent up to 187 minutes or 3 hours 7 minutes each day on their devices. These usage statistics were found to be higher than those in the neighboring countries such as in Indonesia, the Philippines, and Thailand. It was reported that Malaysian smartphone users used their smartphones mainly for accessing social networks and chat applications (Vsery, 2015). Smartphones have been found to be a versatile communication and socialization tool to enhance interpersonal relationships. Additionally, it is also used as a medium to wield social influence and enhance the power of persuasion (Ding et al., 2011). These findings show that smartphones today play an essential role in influencing a community's techno culture, especially among the young generation.

Despite its benefits, excessive and uncontrolled smartphone use has been found to lead to detrimental outcomes such as smartphone addiction (Billieux, 2012). Previous literature has categorized smartphone addiction as a type of behavioural addiction due to the users' inability to control their use of the device. (Akhouri & Kehksha, 2016). Smartphone addiction, especially among university students could lead to mental health issues (Emad & Eman, 2015), as their academic performance could be affected. Additionally, excessive use of mobile phones might cause numerous health problems such as headaches, fatigue, impaired concentration, insomnia, and hearing problems (Bianchi & Phillips, 2005). It was also reported that some interpersonal relationship problems might arise from this addiction, namely the development of low self-esteem, extroversion, higher

approval motivation, and higher self-monitoring. These symptoms are prominent in those who suffer from mobile phone addiction.

Studies have suggested that smartphone addiction would harm an individual's interpersonal health. Dayapoglu et al. (2016) found that inappropriate mobile phone use could negatively affect face-to-face interpersonal interaction, leading to anti-social feelings even among family members. This finding has been supported in a study by Şar (2013), which reported that the duration of mobile phone use was noticeably higher not only among those who were addicted to it, but also among adolescents who felt lonely or detached from other people. Apart from that, Engelberg and Sjöberg (2004) found an association between smartphone addiction and behavioural problems, such as poor social skills, low self-confidence, and low self-esteem. Overall, these findings have emphasised the negative effect mobile phone addiction would have on the development or maintenance of interpersonal relationships. Such an impact could be unfavourable to adolescents who required important interpersonal skills for their future endeavours.

Mobile addiction has been more common among college students as they have been the most rapid adopters of cell phone technology (Smith et al., 2011). Many previous research studies have suggested an association between cell phone usage and students' health and academic achievement. In terms of its impact on academic achievement, the effect was partly determined by the nature of the task a student was engaged in when using the mobile phone. A cross-sectional study involving a sample of undergraduate private college students in the United States (U.S) also found that high videogame use was associated with low grade point average (GPA) (Weaver et al., 2013). Additionally, associations between calling and texting, and low self-reported, GPA and a self-reported measure of academic difficulty were also identified among a sample of first-year university students from the U.S and a sample of Taiwanese female university students, respectively (Hong et al., 2014; Jacobsen & Forste, 2011). Meanwhile, another study noted that males who were heavy internet users and favouring online games had lower average academic grades compared to non-heavy users and those who especially favour information seeking and chatting (Chen & Tzeng, 2010).

The above findings showed that mobile phone addiction has had an adverse health outcome and negative impacts on students' academic behaviour. Moreover, more recent studies have also provided new

insights suggesting negative associations between mobile phone use and academic behaviour. A study conducted on undergraduate college students from a public U.S university has found a negative association between texting and academic performance (Lepp et al., 2014). Similarly, a study by Junco (2012) established a negative relationship between Facebook use and Grade Point Average and time spent studying. In another study that had used a nationally representative sample from Taiwan, showed that female heavy internet users who particularly favour information seeking and chatting were found to have better academic performance than female non-heavy users. These results seemed to suggest that mobile use was a double-edged sword for young adults in tertiary institutions.

Based on the reviewed literature, this present study has identified the following research objectives:

1. To determine the overall mean of mobile addiction, interpersonal relationship, and academic behaviour among young adults in tertiary institutions.
2. To identify any significant relationship between mobile addiction, interpersonal relationship, and academic behaviour among young adults in tertiary institutions.
3. To identify the relative contributions of mobile addiction and interpersonal relationship towards the variation score of academic behaviour among young adults in tertiary institutions.

METHODOLOGY

Research Method and Design

This study employed a quantitative research paradigm to investigate the relationship between mobile addition, interpersonal relationship, and academic behaviour among young adults in tertiary institutions. A descriptive correlational research design using a survey questionnaire was deemed appropriate for exploring the relationships between these three variables in a cross-sectional study (Fraenkel & Wallen, 2012).

Sampling and Research Instrument

Using simple random sampling, a total of 150 young adults in a tertiary institution were chosen to answer the survey questionnaire, and 110 (73.3%) respondents completed the questionnaire. The participants

for the present study were selected from a public university located in Selangor, Malaysia and most of them own a smartphone. However, due to the Covid-19 outbreak in February 2020, data collection was also severely affected. Many students had to resort to online learning at home, and a majority of them experienced a deplorable networking service in their hometowns, and were unable to continue their participation in the study survey. Fast and stable internet connection remains a much-desired service in Malaysia as reports of students having to climb trees in rural parts of East Malaysia were front paged in many local newspapers (The Star, 2020).

Instrumentation

The primary instrument used in this study is a survey questionnaire adapted from a few previous studies. The survey questionnaire is instrumental in collecting data from multiple variables in a cross sectional study.

Mobile Addiction

Mobile addiction has been defined as “a disorder involving compulsive overuse of the mobile devices, usually quantified as the number of times users access their devices or the total amount of time, they are online over a specified period” Rouse, (2018, p.1). Mobile phone addiction levels were measured in the present study using items adapted from a previous research study conducted by Noradilah (2012). The questionnaire used in the present research consisted of 30 items and was divided into four dimensions, namely, on relationship, addiction, positive effects, and adverse effects. The participants marked the answer with which they agreed about their mobile addiction in the past six months, on a 6-point Likert-type scale (1 = Strongly Disagree, 2 = Disagree, 3 = Somewhat Disagree, 4 = Somewhat Agree, and 5 = Agree, 6 =Strongly Agree). The higher the mean score would mean the higher the level of mobile addiction.

Interpersonal Relationship

An interpersonal relationship has been defined as “the relations between individuals, including friendship and romantic relationships” (Oxford Reference, 2021, p.1). The measurement of interpersonal relationship was designed on the basis of a rigorous review of the vast literature obtained from across cultures and countries (Procidano & Heller, 1983; Rubin et al., 1988; Mccarroll et al., 2008; Lanette

et al., 2018). The interpersonal relationship construct measurement supported the three dimensions of the relationship of interest in the present study, that is, relationship with family, relationship with friends, and relationship in social media. This construct comprised 18 items altogether. The participants were instructed to mark the answer on a 6-point Likert-type scale (1 = Strongly Disagree, 2 = Disagree, 3 = Somewhat Disagree, 4 = Somewhat Agree, and 5 = Agree, 6 = Strongly Agree), to reflect their assessment of how their interpersonal relationship was affected by the use of a smartphone. A higher mean score would reflect a more desirable interpersonal relationship.

Academic Behaviour

Academic behaviour has been defined as a set of academically desirable behaviour leading to academic performance (Wentzel, 1993). The newly developed construct of academic behaviour was adapted from past studies such as those by Hoffman (2009), Amez and Baert (2020): and Okafor et al. (2020). This academic behaviour construct has a total of 20 items. These items were scored on a 6-point Likert scale of 1 (Strongly Disagree) to 6 (Strongly Agree). The participants marked the frequency with which they agreed with how their academic behaviour had been affected by smartphone use in the past six months. A higher mean score would reflect a more desirable academic behaviour.

Reliability and Validity

The instrument validation and reliability tests were performed to achieve the righteousness of measures and to incorporate a sufficient representative set of items within the questionnaire. Concerning the instrument's validity, two senior psychology lecturers were asked to check on the content validity of the items as they were considered education experts. No items were deleted, and only some changes have been made on the items' sentence structure. The commonly used procedure of Cronbach Alpha analysis was used to measure the instrument's reliability. The result of the reliability coefficient indexes obtained showed that the Cronbach Alpha values for mobile addiction (.88), interpersonal relationship (.83), and academic behaviour (.85) were deemed reliable (see Table 4). Hair et al. (1998) stated that the alpha with more than 0.70 or higher values would be considered acceptable. Thus, this instrument has fulfilled the essential requirement of validity and reliability for a survey study.

Data Collection and Statistical Analysis

The data was collected using Google Form, and the link was distributed via students' WhatsApp groups. The data were analysed using SPSS version 20, and descriptive statistical analysis such as the mean and standard deviation were used to describe the variables of mobile addiction, interpersonal relationship, and academic behaviour. According to the National Center for Education Evaluation and Regional Assistance (2017) in the United States, descriptive analysis could characterise the world or a phenomenon by answering questions about who, what, where, when, and to what extent. Whether the goal is to identify and describe trends and variation in populations, create new measures of key phenomena, or describe samples in studies aimed at identifying causal effects, description plays a critical role in the scientific process in general and education research in particular. Since the topic of mobile addiction has not been much researched, descriptive analysis will help to provide prospective researchers with a broad insight into the research data, especially in its local context. Meanwhile, inferential statistical analyses such as correlation and multiple regression were instrumental in identifying the relationship between the three variables, and the contribution of other factors such as, hours spent, ethnicity, age, gender, mobile addiction, personal status, and interpersonal relationship on the academic behaviour variation score among these young adults.

FINDINGS

Mobile Addiction among Young Adults in a Tertiary Institution

The results showed that most young adults in the present study agreed that mobile addiction could bring about adverse physical and physiological effects. They admitted suffering from a slight pain in their wrists or at the back of their neck while using smartphones ($M=3.51$, $SD=1.42$). They also affirmed that they experienced a light headache or blurred vision ($M=3.70$, $SD=1.39$) and felt tired due to inadequate sleep induced by excessive smartphone usage ($M=3.97$, $SD=1.27$). They also experienced adverse psychological effects, such as the urge to use their smartphone right after they had stopped using it ($M=3.89$, $SD=1.24$), feeling that their life would be empty without the smartphone ($M=3.98$, $SD=1.31$), and that they were only able to get rid of stress with the help of a smartphone ($M=4.31$, $SD=1.08$). These responses indicated that these young adults experienced, to a

certain degree, the physical and psychological effects of excessive mobile phone use and dependency.

The findings also revealed an above average addiction to mobile phones among the respondents, that is, these young adults indicated that they would never give up using smartphones even when their daily life has been greatly affected by it (M=3.54, SD=1.22). They also felt that they were unable to stand it if they did not have their smartphones with them (M=3.59, SD=1.60), and due to that, they have tried many times to limit their usage, but their effort had failed every time (M=3.88, SD=1.19). Table 1 shows the mean and standard deviation recorded for each item.

Table 1

Mobile Addiction among Young Adults in Tertiary Education (n=110)

Mobile Addiction among Young Adults	Mean	SD
Relationship Dimensions		
Feeling that my smartphone buddies understand me better than my real-life friends.	2.28	1.15
Preferring to talk with my smartphone buddies, to hang out with my real-life friends or with the other members of my family	2.35	1.24
Feeling that my relationship with my smartphone buddies are more intimate than my relationship with my real-life friends	2.54	1.25
Addiction Dimensions		
Not being able to use my smartphone would be as painful as losing a friend	2.62	1.24
The people around me tell me that I use my smartphone too much	2.72	1.34
Bringing my smartphone to the toilet even when I am in a hurry to get there	2.95	1.51
Getting irritated when bothered while using my smartphone	3.15	1.17
Having my smartphone in my mind even when I'm not using it	3.18	1.15
Feeling impatient and fretful when I am not holding my smartphone	3.26	1.15

(continued)

Mobile Addiction among Young Adults	Mean	SD
Constantly checking my smartphone so as not to miss conversations between other people on Twitter or Facebook	3.33	1.30
I will never give up using my smartphone, even when my daily life is already greatly affected by it	3.54	1.22
Feeling the urge to use my smartphone again right after I stopped using it	3.89	1.24
Using my smartphone longer than I had intended	4.45	1.11
Positive Effect Dimension		
Feeling most liberated while using a smartphone	3.56	1.16
Feeling great meeting more people via smartphone use	3.57	1.34
Feeling calm or cosy while using a smartphone	3.97	1.17
My life would be empty without my smartphone	3.98	1.31
Feeling confident while using a smartphone	4.19	1.04
Feeling pleasant or excited while using a smartphone	4.28	1.08
Being able to get rid of stress with smartphone use	4.31	1.08
Adverse Effect Dimensions		
I won't be able to stand not having a smartphone	3.59	1.30
My fully charged battery does not last for one whole day.	3.59	1.60
Experiencing light headache or blurred vision due to excessive smartphone use	3.70	1.39
Checking SNS (Social Networking Service) sites like Twitter or Facebook right after waking up	3.81	1.42
Having a hard time concentrating in class, while doing assignments, or while working due to smartphone use	3.84	1.33
Preferring searching from my smartphone to asking other people	3.84	1.32
Missing scheduled work due to smartphone usage	3.87	1.20
Having tried many times to shorten the duration of my smartphone use, but failing all the time	3.88	1.19
Feeling tired and lacking adequate sleep due to excessive smartphone use	3.97	1.27
Overall Mobile Addiction	3.52	.67

Note. Likert scale: 1=Strongly Disagree, 2=Disagree, 3=Somewhat disagree, 4=Somewhat agree, 5=Agree, 6= Strongly Agree

Despite the presence of negative after-effects caused by mobile phone addiction, the results showed that most of the students agreed that they felt pleasant or excited while using a smartphone ($M=4.28$), and at the same time felt that they were able to get rid of stress when using their smartphones ($M=4.32$). These high mean scores of the items could explain why students were using their smartphones longer than they had intended to ($M=4.45$). Overall, the findings seemed to suggest that students were inclined towards excessive use of mobile phones, which was clearly an indication of mobile addiction ($M=3.52$), and this trend could be detrimental to the well-being of the students and commitment to their studies; hence it should require intervention from the relevant higher education stakeholders.

Interpersonal Relationship among Young Adults in a Tertiary Institution

Table 2 shows the interpersonal relationship among young adults in higher education in Malaysia. The findings show that the interpersonal relationship of young adults was normal long before they came into possession of a smartphone. This pre-smartphone use stage finding was clearly seen from the overall score for this construct ($M=3.22$ and $SD=.84$). This was because most of the respondents somewhat disagreed that their mobile phone usage had influenced their interpersonal relationship. This showed that they did not think that smartphones had helped their relationship to become closer, as their relationship with their friends and family members had already been close even before they had a smartphone. Besides, the students had also admitted that since using smartphones, their family and friends had never asked them to put their phones away during meals ($M=3.39$, $SD=1.56$). This finding seemed to suggest that the student's family and friends did not think of smartphones as a problem in their relationship. However, it is a matter of concern to note that students did not think that smartphones overuse could ruin their relationship with their family members and friends ($M=3.48$, $SD=1.68$). This draws attention to the possibility that students had not considered the adverse side effects of their overuse of smartphones.

Table 2

The Interpersonal Relationship among Young Adults in a Tertiary Institution (n=110)

Interpersonal Relationship among Young Adults	Mean	SD
Relationship with Family		
My family members and friends feel more comfortable with me when I use a smartphone to share my problem	2.55	1.14
My family members try to help me with my smartphone addiction.	2.63	1.30
Since I have the smartphone, I consider my relationship with family members to be close.	3.24	1.45
I put a security code on my smartphone to secure my relationship with my spouse	3.38	1.61
My partner/spouse/family asked me to put my smartphone away / switch it off during meals	3.39	1.56
I admit that smartphone overuse may ruin my relationship with my partner/spouse/family, but I still ignore that fact	3.48	1.68
Relationship in Social Media		
I avoid talking about my problem face to face because networking apps work better for me	2.58	1.30
My family members think that I spend too much time on social networking.	3.18	1.31
I feel out of touch when I haven't logged onto social networks for a while.	3.64	1.28
I think that I'm good at helping others to solve problems with a smartphone because it saves more time and money than meeting them in person	3.67	1.34
I feel I am a part of the social networking community	3.70	1.16
I felt connected to my friends when using my smartphone	3.97	.96
Relationship with Friends		
I feel more comfortable having virtual friends than meeting real friends face to face	2.63	1.35
My friends are closer to me since they realise my real attitude from chatting through a smartphone	2.75	1.22
I found myself funnier and happier when I use a smartphone to communicate with my friends	2.91	1.34

(continued)

Interpersonal Relationship among Young Adults	Mean	SD
Most of the time I talk about my problems with my friends on the smartphone	3.12	1.34
Since I have the smartphone, I consider my relationship with friends to be close.	3.37	1.41
I feel that my friend and I can become closer if we interact a lot via smartphone	3.65	1.14
Overall Interpersonal Relationship	3.22	.84

Note. Likert scale: 1=Strongly Disagree, 2=Disagree, 3=Somewhat disagree, 4=Somewhat agree, 5=Agree, 6= Strongly Agree

Despite that assumption, the students did acknowledge and agree that smartphones positively affected their interpersonal relationships with their friends and family members. They agreed with the items which indicated that with the presence of smartphones, they could be closer with their friends ($M=3.65$, $SD=1.14$), and made them better at helping others to solve problems because it helped save more time and money than meeting their friends in person ($M=3.67$, $SD=1.34$). Furthermore, they felt more connected with their friends when using smartphones ($M=3.97$, $SD=.96$). In conclusion, the students could be seen to have an average level ($M=3.22$, $SD=.84$) of interpersonal relationships with their friends and family members, with or without mobile phones as they had disagreed with most of the negative items on interpersonal relationships.

Academic Behaviour among University Students

Table 3 presents the analysis of academic behaviour among young adults in a tertiary institution in Malaysia. The findings show that young adults were aware of the appropriate time to use or not to use their smartphones during class, or in general, in their daily life. They felt that smartphones did not disrupt their academic behaviour. For example, the students disagreed that they often updated their social networking status during class time ($M=2.25$, $SD=1.26$), and that they felt distressed in class when their phone is not with them ($M=2.92$, $SD=1.21$). They further affirmed that smartphones did not distract them from being fully engaged in classroom activities ($M=3.21$, $SD=1.21$). Additionally, the students also disagreed that the use of smartphones had lowered their academic performance. This finding was further supported by the students' disagreement to the suggestion that their academic performance had been affected due to time spent on their smartphone ($M=3.21$, $SD=1.31$), and their grades or homework

had been affected due to time spent on their smartphone ($M=3.29$, $SD=1.42$). On the other hand, students indicated that smartphones have brought positive side effects on their academic performance. They had marked “agree” to other statements suggesting that their academic performance had improved due to their being able to access smartphone technology ($M=4.22$, $SD=1.02$), and that smartphones had also helped them to improve the quality of their education ($M=4.40$, $SD=.92$).

Table 3

Academic Behaviour among Young Adults in a Tertiary Institution (n=110)

Academic Behaviour among Young Adults	Mean	SD
Negative Academic Behaviour		
I play games every day on my smartphone during Lectures	2.19	1.28
I have been in debt due to excessive smartphone use.	2.24	1.27
I often update my social networking status during class time	2.25	1.26
Smartphone use does not allow me to engage in-class activities	2.58	1.28
I waste my time writing / sending SMS during class time	2.69	1.19
I spend more money on a smartphone than academic expenses	2.73	1.50
I feel distressed in class when my phone is not with me	2.92	1.21
Smartphone devices do not allow me to engage fully in-class activities	3.21	1.21
My time spent on academic tasks has been interrupted due to the time I spend on the smartphone	3.21	1.31
My grades or homework have been affected due to the time I spend on the smartphone	3.29	1.42
I feel sleepless due to my overuse of smartphone, not because of my academic study	3.32	1.39
The use of smartphone devices by other students distracts me from paying attention in class	3.40	1.35
WhatsApp notifications from various groups sometimes ruin my mood and activities during my study time	3.57	1.42
Using smartphone devices distracted me from doing my classroom assignments	3.64	1.13

(continued)

Academic Behaviour among Young Adults	Mean	SD
Positive Academic Behaviour		
I concentrate better on my studies when using smartphone devices to accomplish my learning goals	3.45	1.22
I prefer using a smartphone rather than a laptop to search for academic information	3.60	1.68
The smartphone helps me to manage homework via a reminder application	4.13	1.20
My academic performance has improved due to smartphone technology	4.22	1.02
The use of smartphone devices facilitated my collaboration with other students	4.31	1.05
The smartphone has helped me to improve my quality of education	4.40	.92
Overall Academic Behaviour	3.27	.66

Note. Likert scale: 1=Strongly Disagree, 2=Disagree, 3=Somewhat disagree, 4=Somewhat agree, 5=Agree, 6= Strongly Agree

The young adults in the tertiary institution under investigation also agreed that smartphones had helped them to manage their homework academically through reminder applications (M=4.13, SD=1.20) and to collaborate with their friends (M=4.31, SD=1.05). In conclusion, it can be summarised that these students' academic behaviour has been moderately affected by smartphones. However, this influence was skewed positively towards the advantages of using smartphones as a tool for keeping organised, seeking of information, and collaborating. These young adults have, in general, indicated their disagreement on most of the items which related to the negative relationship between smartphone use and their academic performance (M=3.27, SD=.66)

Relationship between Mobile Addiction, Interpersonal Relationship, and Academic Behaviour among Young Adults in a Tertiary Institution

To determine the relationship between the variables, Pearson's coefficient analysis was conducted. The result indicates that $r = .58$, $p = .00$, which therefore, suggested a positive, moderate, and very significant relationship between mobile addiction and interpersonal relationships. However, the relationship between mobile addiction and academic behaviour has been identified as negative, low, and very significant relationship ($r = -.39$, $p = .00$).

Table 4

The Relationship between Mobile Addiction, Interpersonal Relationship, and Academic Relationship among University Students in Malaysia. (n=110)

Factors	M	SD	1	2	3
1. Mobile Addiction	3.52	.67	1		
2. Interpersonal Relationship	3.22	.84	.58 ^b	1	
3. Academic Behaviour	3.27	.66	-.39 ^b	.44 ^b	1

Note. ^ap < .05, ^bp < .01 Cronbach's alphas are shown in the diagonal.

The Predicting Factors of Academic Behaviour among Young Adults in a Tertiary Institution

Table 5 shows the multiple regression analysis conducted to examine the contributions of the predicting variables towards the variance of academic behaviour among young adults in higher education. The independent variables, such as mobile addiction (X1), and interpersonal relationship (X2) were entered into a multiple regression model to observe any significant prediction towards the academic behaviour of young adults in a tertiary institution.

The findings of the analysis as shown in Table 5 reveal that interpersonal relationship (Beta=.31, t=3.34, p<.01), and mobile addiction (Beta=-.20, t=1.96, p<.05) were identified to be significant contributors towards the variance of academic behaviour among young adults in the tertiary institution under investigation in the present study. The results show that the highest value for the standardised coefficient for the variance was the interpersonal relationship status, with a beta value of .31. Hence, with every unit increase in interpersonal relationships, it was expected that there would be a .31 point increase in academic behaviour. This result was statistically significant at t = 3.34, p <.01. However, the negative beta value for mobile addiction indicated that every unit of increase in mobile addiction was expected to lead to a .20 unit decrease in academic behaviour. The result was significant at t=1.96, p <.05. This finding has highlighted an important point worthy of noting, that is, that good interpersonal relationship positively impacted academic behaviour. However, mobile addiction had had a negative impact on academic behaviour among young adults in higher education. The overall result has reported an R square value of .29,

and this implied that 29 percent of the variance in academic behaviour scores could be predicted with these two variables of interpersonal relationship and mobile addiction.

Table 5

The Relationship between Mobile Addiction, Interpersonal Relationship, and Academic Relationship among Young Adults in a Tertiary Institution (n=110)

Model	Unstandardised Coefficients		Standardised Coefficients			
	B	Std. Error	Beta	T	Sig.	
1	(Constant)	1.28	.48		2.74	.00
	Mobile Addiction (X1)	-.21	.15	-.20	1.96	.04
	Interpersonal Relationship (X2)	.30	.07	.31	3.34	.00

Note. a. Dependent Variable: Academic Behaviour $R^2=.29$, Adjusted $R^2= .28$, $F = 6.87$, $p < .00$ Predictors: (Constant) Mobile Addiction, Interpersonal Relationship

DISCUSSION

The study has identified moderate levels of mobile addiction, when investigating the relationship between interpersonal relationships and academic behaviour among young adults in higher education. These findings concur with those which came from studies conducted in South Korea. These researches also identified a moderate level of mobile addiction among middle school students, who similar to the subjects in the present study, were mostly identified as normal smartphone users (Cha & Seo, 2018; Vsery, 2015). By using the Smartphone Addiction Proneness Scale, Cha and Seo (2018) found that only 30.9 percent (n=563) of their respondents were classified as at-risk users, while the remaining 69.1 percent (n=1261) of the respondents were classified as normal users. This finding showed that mobile addiction among middle school students in South Korea was still at a moderate level, which corresponds to the finding of this present study.

The correlation analysis result indicated a positive, moderate, and very significant association between interpersonal relationship and academic behaviour. However, the relationship identified between mobile addiction and academic behaviour was low, negative and very significant. These results have been further confirmed by the multiple regression analysis, which also indicated a positive impact of interpersonal relationships on academic behaviour, and a negative impact of mobile addiction on academic behaviour. Most previous studies in higher education did not support these positive results between interpersonal relationship and mobile addiction. In Bianchi and Phillips's (2005) study, extroversion and anxiety were identified as significant predictors of mobile phone addiction, which was similar to the finding in Dayapoglu et al. (2016), who also identified problematic mobile phone use as a variable that had led to negative interpersonal relationships. Besides, Volungis et al. (2020) have also identified that mobile addiction would affect interpersonal relationships. Both Celikkalp et al. (2020) and Akhouri and Kehksha (2016) have also found that mobile addiction would negatively impact the interpersonal relationship among the users of smartphones, a finding that was contrary to the findings in this study. However, in contrast, Whiteside and Lynam (2001) found that depression and anxiety could significantly predict mobile phone dependence. These inconclusive findings from previous studies seemed to suggest that the relationship between mobile addiction and interpersonal relationship requires further exploration and clarification.

This study found a negative, low, but very significant relationship between mobile addiction and academic behaviour. This finding was supported by Celikkalp et al. (2020), Albarashdi et al. (2016) and Kibona and Mgaya (2015), who also found a negative relationship between mobile addiction and academic performance. A critical review of the literature on smartphone use and academic performance conducted by Amez and Baert (2020) also revealed that out of the 23 papers included in the critical review, 18 reported negative relationships between smartphone use and academic performance, while the remaining five reported no significant relationship. The contradictory findings of previous studies clearly suggest the need for further research to be conducted, possibly by including students from other higher education institutions, refining the constructs included in the instrument, and considering the changing norm from traditional learning approaches to online and distance learning approaches, a new development due to the COVID-19 pandemic situation currently afflicting the whole world.

The major finding from the present study was that interpersonal relationships and mobile addiction had been identified as contributing factors which could impact academic behaviour. This finding was supported by earlier studies such as in Amez and Baert (2020), and Celikkalp et al. (2020) who also found that interpersonal relationships and mobile addiction could predict the academic success of business students. These findings were also closely related to two other similar mobile addiction studies conducted on nursing students by Jeong and Lee (2015), and medical students by Santhi and Rajesh (2020). In their study, Jeong and Lee (2015) found that academic achievement and friendship were among the factors contributing to 17.4 percent of the student nurses' academic behaviour. Santhi and Rajesh (2020) also found that students were aware that mobile phone technology could positively and negatively affect academic achievements. On the positive side, the students agreed that if used responsibly, the technology embedded in mobile phones could help them realise their learning and educational objectives, as well as with their productivity. Excessive and irresponsible mobile phone usage was however, likely to lead to adverse outcomes, in particular poor academic performance. These findings have therefore, clearly suggested that academic performance and mobile phone usage were interrelated and could influence each other. Similarly, students were aware of the advantages of mobile use and the detrimental effects of overuse. Nevertheless, results from other previous studies have also indicated that the variables being studied were unable to lead to conclusive findings. Hence more in-depth research, involving studies which are longitudinal and inclusive of other relevant variables, to explore the phenomenon should be conducted.

THEORETICAL AND PRACTICAL IMPLICATIONS

One of the significant theoretical implications of this present study is to confirm the correlation between interpersonal relationships, academic behaviour, and mobile addiction among young adults in higher education. In line with Bandura's social learning theory, this study has suggested that good interpersonal relationships could enhance young adults' academic behaviour in university. In addition to that, social factors were also determined to influence mobile use and academic behaviour among university students, as postulated by the U & G approach. The findings of this study also correspond to the proposal in displacement theory that student academic pursuits and performance were negatively correlated to the time spent on mobile

phone use. This means that the more time students spend on accessing media content on their smartphone, the more displaced other activities, whether academic or non-academic, will be from their daily life, which in the long run can result in behavioural and social problems. Overall, the present findings have reaffirmed the contentions proposed by the theoretical frameworks referred to as informing this study.

Undoubtedly, the use of smartphones has its advantages and disadvantages. However, the pervasive nature of its use and utility in this digital age far outweighs its disadvantages and makes it an essential tool in one's daily life. Young adults are among the highest users of mobile phones, and with the shift to online learning due to the COVID-19 pandemic, smartphones are essential tools for young adults enrolled in tertiary institutions; they are used to communicate, access information seamlessly, manage student learning progress, and facilitate student educational pursuits. Nevertheless, despite its many beneficial uses and advantages, a lack of awareness the abuse, and misuse of mobile phone technology among young adults can result in detrimental effects such as mobile phone addiction and dependence, as suggested in the tenets of Displacement Theory. The students may also trade off the time that should be used for studying with excessive media use on smartphones. As identified in this study, extensive hours spent on a smartphone in a day resulted in the displacement of student time and resources in higher learning institutions.

The findings of this study also have practical implications for all stakeholders. The first implication is the need to develop an awareness program on the advantages and disadvantages of mobile use in educational institutions. Although the study found that the degree of mobile addiction and misuse among students were still at a moderate level, universities must take precautionary measures by developing prevention and intervention programs to minimise the negative associations between media use and academic performance and interpersonal relationship. The programs should include multiple pathways to combating the negative impacts of media on young adults and should target both at-risk and non-at-risk students.

Apart from that, the implementation of any prevention and intervention programs will require the active involvement of parents and educators to ensure effective and sustainable outcomes. Familial support and care are pathways for the healthy psychological, emotional, and cognitive development of adolescents and young adults, and their appropriate adjustments in society. Adolescents and young adults

who grow up in the afore-mentioned environment tend to develop healthier and more positive habits, which can in turn, influence their consumption of media via electronic devices, namely smartphones. Studies have shown that parent-child relationships that have been fostered through affection and communication played critical roles in reducing social problems and child delinquency (Law et al., 2010), promoted emotional and social adjustment (Sui-Chu & Willms, 1996) and improved academic performance (Cheung & Pomerantz, 2011).

Families of adolescents and young adults could be invited to get involved by providing their feedback on the development of social programs and public policies. Additionally, family members have to be encouraged to become more engaged in the media use of their adolescents and young adults to moderate any probable adverse effects. Programs that emphasise the implementation of scheduling or parental monitoring of media use, and parental involvement in academic and social development, would be advantageous to managing the attitude of the adolescents and young adults toward media use, academic performance and social development. This was evident in the findings of this study, where parental involvement was instrumental in mitigating negative associations between media use and academic performance.

Finally, educational institutions and educators should also play essential roles in shaping students' academic paths and attitudes toward media use, and social adjustment. Educational institutions and policymakers should curate and implement guidelines and policies on ethical and responsible behaviour in the use of mobile phones or portable devices; meanwhile, educators can play the role of being a policy guardian. The guidelines and policies should clearly stipulate the university's expectations of their students on the use of devices, media consumption, self-conduct, and academic and non-academic expectations. Although most of these policies are already in place, policies that specifically promote responsible media and mobile technology use are scarce. The availability of such policies will help raise students' awareness and enhance their ability to exercise self-discipline and autonomy (Reschly & Christenson, 2006).

CONCLUSION

Given the impact of the current COVID-19 pandemic, the use of digital tools has become imperative as teaching and learning activities

have shifted from the traditional face to face mode to online distance learning platforms. Mobile phones are no longer a nuisance in the classroom, but an essential tool for learning. Mobile phones have become ubiquitous and despite their potential disruptive power in our lives, are here to stay. The immediate challenge for learning institutions, educators, parents, and other stakeholders alike, lies beyond the management of mobile phone addiction. The findings of this study indicated that mobile addiction among students is currently at a moderate level and that the misuse of smartphones is not a critical issue at the moment. However, precautionary measures such as establishing a policy on mobile phone use and misuse in higher learning institutions will help provide guidelines should the need arise. Setting ethical rules and guidelines for proper mobile use will help students balance the use of their mobile phones for academic and non-academic, entertainment, and social purposes.

This study also established that the variables investigated, namely mobile addiction, interpersonal relationship, and academic behaviour, were moderately interrelated. The findings showed that interpersonal relationship positively influenced academic behaviour, while mobile addiction negatively influenced students' academic behaviour. These findings have important implications on how learning institutions should educate and shape young adults' views on the purpose and proper usage of mobile phones, its potential role and influence in their lives, as well as the detrimental effects it poses to their well-being. Consideration should also be given to equipping young adults in tertiary institutions with the know-how on using mobile phones responsibly and the mobiquette (mobile phone etiquette) that should be practised. To conclude, it has to be acknowledged that mobile phones can significantly help young adults in our institutions of higher learning in many ways. Used responsibly, especially in the context of one's educational development, can help enhance the student learning experience, academic performance, and cognitive development. Nonetheless, excessive use or misuse of the device can negatively affect both the users and the people around them.

SUGGESTIONS FOR FUTURE RESEARCH

This study has revealed several possible areas for future research, particularly in the methodology used to undertake a study of this nature. It is suggested for future research to employ a causal interpretation design in place of the current correlational design. Since

most of the preliminary investigations were correlational analyses or logistic regression analyses, causal interpretations were not possible. Future research should also consider using a mixed-method research design approach which will most likely yield more in-depth and holistic findings to describe the associations between mobile addiction and young adults' academic behaviour and interpersonal relationship. Quantitative research allows the researcher to generate numerical data that are absolute, objective, and statistically valid. In contrast, qualitative research allows the researcher to gather in-depth data in a naturalistic setting that may reflect participants' emotions, perceptions, and lived experience (Saldana, 2009). Qualitative data are useful in enhancing an understanding of the participants' lived experiences, and quantitative data are useful in establishing cause-and-effect relationships and generalising findings to a larger population. Thus, the researcher believes that using one method in the present study will tell investigators only one side of the story, whereas a mixed-method research design can allow for corroboration through multiple sources, which will yield more comprehensive outcomes (Amez & Baert, 2020). Finally, considering the nature of this research, which investigates behaviour that is hard to access in a cross-sectional study, future research should consider conducting a longitudinal study. Longitudinal studies can provide a more complete picture of the short-term and long-term effects of smartphone use among young adults. This will help all the stakeholders to understand better student behaviour with regard to mobile phone and media use, and the interpersonal relationships students foster with other members of their social circle. This knowledge can assist in the identification of risk factors associated with young adults' media use in the specific context of their university.

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