Smartphone Usage among University Students

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Abstract: Smartphone users have increased to over two and a half billion people and it is predicted to rise to five billion by the year of 2020. Prolonged smartphone usage indicates obsession with the virtual world. As smartphone users include students from secondary school to tertiary levels, their constant engagement with mobile phones raises questions of addiction that may have negative consequences on academic performance. Hence the present study aimed to examine problematic smartphone use, hours spent, factors and activities involved, and argue the possible risks of phone addiction among Malaysian university students. The study employed a descriptive research design to collect data, while data analysis was conducted using descriptive statistics such as mean, standard deviation, frequency and percentage. Fifty-five out of eighty students from a public higher learning institution responded to a survey. The results indicated that most of them somewhat agreed that they used smartphones without any compelling reasons at every hour and that it induced emotional stability. The findings implied that the students were somewhat addicted to smartphones but did not use their smartphones for academic purposes. It is expected that the findings from this study will help higher learning institutions to better understand the patterns of smartphone usage among university students and to reduce or control academically disruptive smartphone addiction behaviour.

Keywords: Smartphone, Mobile Phone, Addiction, University Students, Mobile Addiction

1.   Introduction

The industrial revolution 4.0 has brought us closer than ever to machine learning, artificial intelligence and the internet of things in a world that is connected seamlessly. We are exposed to this avant garde technological revolution in one way or another. Undeniably, technology has influenced almost all aspects of our daily lives and has become essential to everyone's life. Ling and Helmersan (2000) claimed that mobile phones have been extremely important for everyday use since the late 1990s. With the advancement in mobile communication technology, connectivity and communication have become more efficient. Mobile communication technology has virtually affected a society's accessibility, security, safety and coordination of business and social activities of everybody. Hence it has become part of the world culture. However, Baig (2014) revealed that the use of mobile phones in schools and colleges are problematic to some extent as it disrupts the mission of schools.

As stated by scholars, mobile addicts can be identified as a person who has a strong desire to use the applications on their mobile phones, e.g., making phone calls, sending text messages, watching

online videos, and posting their status online. Likewise, mobile addicts will constantly be preoccupied with the activities mentioned earlier (Hooper & Zhou, 2007). Mobile addicts will also experience the need to increase the frequency and time of using mobile phones. Normally, mobile addicts also exhibit excessive use and create within themselves a psychological need to be always connected to their smartphones. Symptoms of mobile addiction include feelings of irritability and being lost if separated from their mobile phones (Choliz, 2012; Leung, Konjin, Tanis & Uts; 2007, Choliz & Villanueva, 2009). Besides being addicted, mobile users who are experiencing the above problems often use their phones as a way of escaping from facing real problems or as a mood enhancer to relieve loneliness, anxiety, depression or guilt (Choliz, 2010). Obviously, technological addiction can happen to anyone regardless of age, but it is more prone to adolescent mobile phone users (Al-Barashdi, Bouazza & Jabur, 2015).

In this modern era, the number of mobile phone users has been growing expeditiously across all economic and age categories. However, university students have been identified as one of the largest and important target markets and the most active users of smartphones (Al-Barashdi, Bouazza & Jabur, 2015). Recently, Ozkan and Solmaz (2015) found that generation Z is the most frequent smartphone users although this group disagreed. Since the purpose of this study is to identify problematic smartphone use amongst university students, hence, the number of times spent using smartphones was measured to identify the level of student's mobile addiction in higher education. It followed the same method applied in the previous study by Al-Barashdi, Bouazza, Jabur & Zubaidi (2016) where prolonged time spent on smartphones was interpreted as addiction of smartphones. According to Internet live stat (2017), a website which measures active internet users all over the world regularly, an internet user uses at least 3 hours of internet daily. Dave Chaffey further added that 90% of the time is allocated for using various apps on the Internet such as Facebook and Instagram while another 10% of the remaining time is contributed to skimming through multiple websites (Chaffey, 2017). Based on the issues identified, thus, this study aimed to identify mobile addiction amongst adolescents, i.e. university students in Malaysia. The research objectives of this study are to:

1. measure the amount of time the students spend on using smartphones hourly/each time/each week for learning purposes (Problematic Smartphone Use)
2. determine the factors associated with the use of smartphones by the students (Smartphone User Attitude)
3. determine the type of activities that the students do when they are using their smartphones (Smartphone Use)

The problem that is usually associated with students' overuse of their mobile phones is that it causes mobile addiction, which leads to decreasing academic performance. Kirschner and Karpinski (2010) found that the over use of mobile applications such as Facebook occasionally initiates addiction and reduces academic grades. Further research to understand the core reasons why university students become addicted to mobile phones has found that from a students' viewpoint, smartphones can provide entertainment and relieve them from academic pressure (Rabiu, Muhammed, Umaru & Ahmed, 2016). Liang, Zhou, Yuan, Shao and Bian (2016) also found that internet addiction causes depression among adolescents. In fact, students are supposed to take on their prescribed roles as students, and fully concentrate on their studies. However, mobile phones provide room for students to connect with the outside world during class and thus, sometimes distract and disrupt their learning experience (Israelashvili, Kim & Bukobza, 2012).

Undeniably, looking at the positive side of mobile phones, it can also be used as a learning device in the higher institutions. According to Gideon (2017), students' achievement increased significantly when they used their smartphones as mobile learning devices. In another case study, the students were found to use their smartphones to take pictures of notes that were taught in class. Similarly, Woodcock, Middleton and Nortcliffe (2012) also discovered that the students in their research perceived that smartphones were tools that helped them improve their academic performance Kumar (2011) elaborated in his study that students used their smartphones to download and watch online lectures and to read e-books and slides. These activities have been found to have positively affected the student's learning performance. In addition, Mtega, Bernard, Msungu and Sanare (2012) also showed that students in their study used their smartphones as a medium to improve their academic

learning experience through Google Drive, Google classroom and so on. These applications were used to create, upload, download and share academic resources. Referring to all the above research, it is found that smartphones can also bring positive and negative impacts on the students depending on how they use them. Hence, it is deemed necessary in this study to identify the problematic smartphone use and the time spent on smartphone use in higher education.

2.   Research Method

This section discusses the methodology of the research. It explains the research design and provides detailed explanations on how the data in this study were collected and analysed. A quantitative method was selected due to the utilization of a survey instrument to collect data in this study. Since the purpose of this study is to identify the problematic smartphone use amongst the university students, the use of an instrument which is a questionnaire is deemed the most appropriate research design. According to Creswell and Creswell (2018), an instrument is a tool used to measure, examine or document quantitative survey data. Thus, the questionnaire was adapted from Valderrama (2014) in a PhD study entitled "Development and Validation of the Problematic Smartphone Use Scale" at Alliant International University, San Francisco as the research instrument.

Respondents had to answers all the four parts of the close-ended questionnaire, namely Part A: Problematic Smartphone Use (19 items), Part B: Smartphone User Attitude (18 items), Part C: Smartphone Use (13 items) and Part D: Demographic Factors (20 items). In addition, the medium used for this research is an online survey questionnaire developed using Google form. A total of 80 sets of questionnaires were distributed among postgraduate and undergraduate students at the Faculty of Education in a public university.

Next, the instrument validation and reliability tests were performed in order to achieve the righteousness of measures and with the aim to incorporate a sufficient representative set of items within the questionnaire. For the validity of the instrument, two senior psychology lecturers were asked to check on the content validity of the items as they are the experts in education. No items have been deleted and only some changes have been made on the sentence structure of the items. Besides, the commonly used procedure of Cronbach Alpha analysis has been used to measure the instrument's reliability. The result of the reliability coefficient indexes obtained showed that the Cronbach Alpha values for Problem Smartphone Use (.89), Smartphone User Attitude (.78) and Smartphone Use (.85). were deemed reliable. As stated by Hair, Anderson, Tatham & Black (1998), the alpha with the value of more than 0.70 or higher is acceptable. Thus, this instrument has fulfilled the basic requirement of validity and reliability for a survey study.

The population of this study is university students studying at the Faculty of Education in a public university. Gay, Mills and Airasian (2009) explained that a population is a group of interest to the researcher and which the study would be generalized. The population size of roughly 100 students (N) of postgraduate students at the Faculty of Education needs at least half of the population to provide a normal distribution of the respondents. Overall, out of 80 sets of questionnaire distributed, 55 questionnaires have been received thus making the response rate around 69%. The samples were chosen based on simple random sampling technique. Next, for data analysis, descriptive statistics analysis techniques were used. Basically, descriptive statistics of mean and standard deviation were used to describe the level and patterns of problematic smartphone use among the students in higher education institutions. This research utilizes SPSS Version 22 and Microsoft Excel to analyse the quantitative data.

3.   Result and Discussion

The demographic factors of respondents entailed various factors such as gender, age, ethnicity, relationship status, employment status, education level, study mode, availability of smartphone, number of hours using smartphones, type of smartphone and purpose of using smartphones.

Table 1. Gender, Ethnicity, Age, Level of Education, Studentship Status and Mode

Gender / Ethnicity / Age / Education Level / Student Status	Frequency	Percent
Female	41	74.5
Male	14	25.5
Total	55	100%
Malay	51	
Chinese	1	92.7
Dusun	1	1.8
Iban	1	1.8
Bidayuh	1	1.8
Total	55	100%
21-25	44	80
26-30	9	16.4
31-35	2	3.6
Total	55	100%
Bachelor's degree	29	52.7
Diploma	23	41.8
Master's degree	1	1.8
SPM	2	3.6
Total	55	100%
Not a student	2	3.6
Full time student	45	81.8
Part time student	8	14.5
Total	55	100%

Based on the Demographic Profile of the respondents in Table 1, the majority of the respondents (74.5%, n=41) were female and only 25.5%, n=14 were male. In terms of ethnicity, majority of the respondents were Malays, yielding 92.7% (n=51) of the total number of respondents. This was followed by other ethnic groups such as Bidayuh 1.8% (n=1), Dusun 1.8% (n=1), Chinese 1.8% (n=1) and Iban 1.8% (n=1). The students' age ranged from 22 to 36 years old throughout the undergraduate and postgraduate programs. Age distribution of the respondents entailed 21-25 years old, yielding 80% of the majority (n=44). The second highest average age group was 26-30, yielding 16.4% (n=9). Age ranged from 29 to 36 formed the smallest age group of respondents, yielding 3.6% (n=2) respectively.

Next, is the student's level of education. The highest respondents are the bachelor's degree students (52.7%, n=29) compared to Diploma (41.8%, n=23), master's degree (1.8%, n=1) and *Sijil Pelajaran Malaysia* (SPM) (3.6%, n=2). However, the student status has also been classified into 'not a student', "full time student" and "part time student". Besides, a majority of the respondents have been identified as "full time students" (81.8%, n = 45), followed by "part time students" (14.5%, n = 8) and the least respondents were "not a student" (3.6%, n = 2).

Table 2. Overall time spent on using smartphone

Average number of hours respondents spend using their smartphone each day

Hours	Frequency	Percent
3 - 6 hours	25	45.5
7-10 hours	15	27.3
11-15 hours	6	10.9
1-2 hours	4	7.3
More than 20 hours	3	5.5
16- 20 hours	2	3.6
Total	55	100.0

How long do respondents typically spend on their smartphone each time

Minutes	Frequency	Percent
30-44 minutes	11	20.0
15-19 minutes	8	14.5
10-14 minutes	7	12.7
20-29 minutes	6	10.9
60-89 minutes	6	10.9
90 minutes to 2 hours	6	10.9
45-59 minutes	5	9.1
More than 4 hours	3	5.5
6-9 minutes	2	3.6
2-4 hours	1	1.8
Total	55	100.0

Average number of hours you spend each week using your smartphone

Average Number of Hours	Frequency	Percent
More than 40 hours	11	20.0
26-30 hours	8	14.5
11-15 hours	6	10.9
16-20 hours	6	10.9
31-35 hours	6	10.9
21-25 hours	5	9.1
5-7 hours	5	9.1
36-40 hours	4	7.3
2-4 hours	2	3.6
1 hour or less	2	3.6
Total	55	100.0

Proportion of time spend using smartphone for learning

| Proportion of Time	Frequency	Percent
Approximately a quarter of the time (25%)	24	43.6
Approximately half the time (50%)	16	29.1
10% - 20%	6	10.9
75% - 95%	3	5.5
Almost always (95% - 100%)	2	3.6
Approximately three-quarters of the time (75%)	2	3.6
Less than 10%	1	1.8
Zero	1	1.8
Total	55	100.0

As reported in Table 2, it has been identified that the majority of the respondents spend their day in using their smartphone between 3 to 6 hours (45.5%, n=25), followed by 7-10 hours (27.3%, n=15) a day. Meanwhile, there were three respondents who spent more than 20 hours (5.5%, n=3) on their smartphone each day. Next section in Table 2 also presented the findings on how long the respondents typically spend their time with their smartphone each time. The finding shows that the highest number of respondents have concluded that they typically spent their time on smartphone between 30-44 minutes (20.0%, n=11), followed by 15-19 minutes (14.5%, n=8) and at least 10-14 minutes (12.7%, n=7) each day.

Later, the question also asked the students on the average number of hours spent each week using smartphone, the results showed that majority of students have concluded that they spent more than 40 hours each week (20%, n= 11), followed by 26-30 hours (14.5%, n= 8) , 16-20 hours (10.9%, n = 6), 11-15 hours (10.9%, n = 6), and the least 31-35 hours (10.9%, n = 6). Lastly, for the time spent section, the researchers asked about the time students used their smartphone for learning purposes. It was found that the majority of the respondents spend their time with their smartphone for learning purposes in approximately a quarter of the time (43.6%, n=24), followed by 16 respondents who spent approximately half their time (29.1%) using their smartphone to search for academic information.
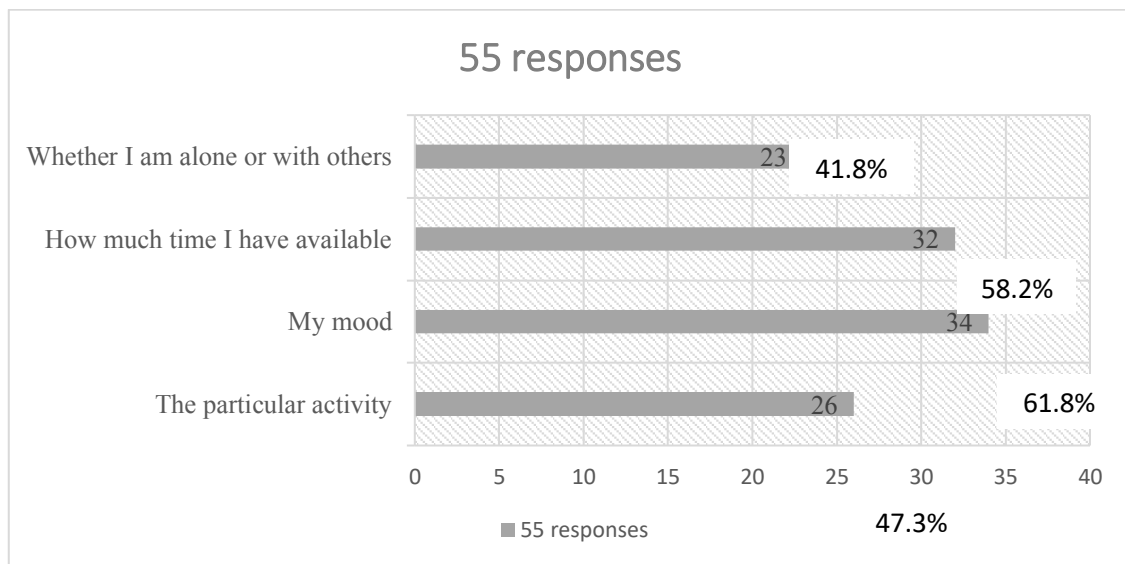
Fig. 1 Factors associated with the use of smartphone

As depicted in Figure 1, the respondents were allowed to choose multiple reasons for using smartphones in Part C of Smartphone Use. There are a number of factors that have been identified to be associated with the behaviour of spending long hours on their smartphone. The findings show that the majority of the students used their smartphones based on their mood (61.8%, n = 34) and followed by the availability of time for the day (58.2%, n=32). However, a substantial number of respondents also indicated that they used their smartphones for particular activities (47.3%, n =26) and whenever they were alone or with others (41.8%, n =23).

Overall responses
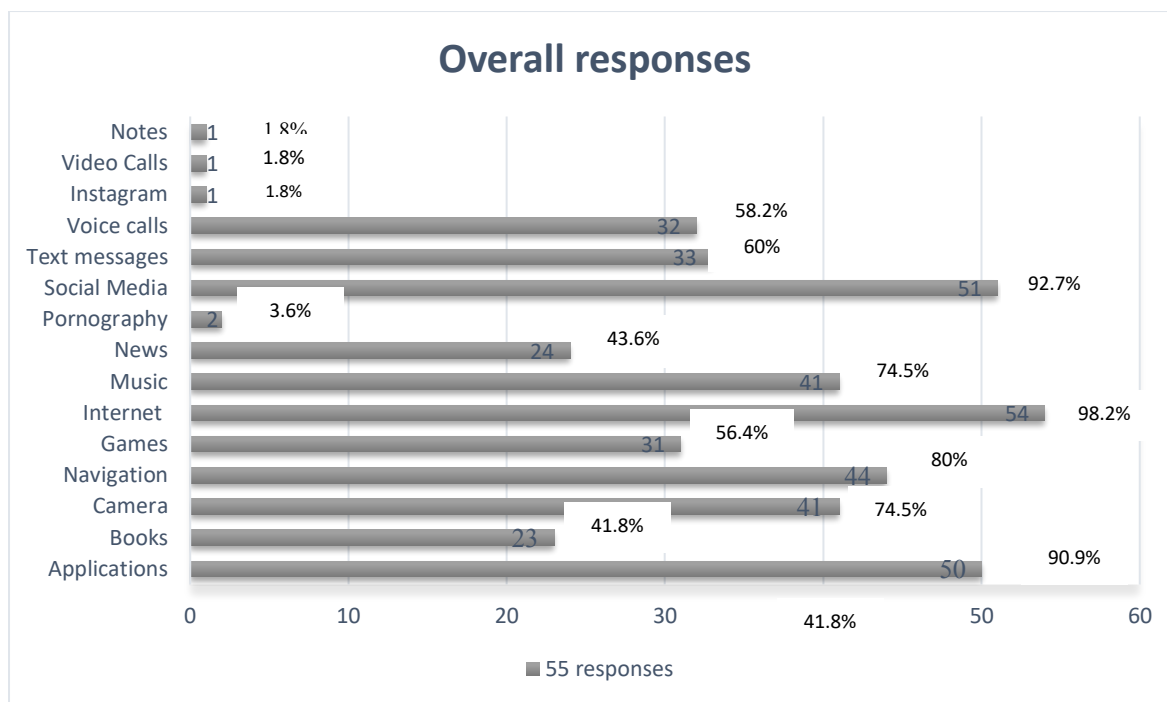
Fig. 2 Types of activities on the smartphone

Figure 2 presented the findings on the types of activities on smartphone usage among the respondents. Since the smartphones were designed to be internet friendly, hence, majority of the respondents have chosen to choose "Internet" as their main activities (98.2%, n=54). Meanwhile the second highest activity was closely related to the trending of updating information on "Social Media" (92.7%, n=51), and the third highest activity highlighted the use of "Apps or Application" (90.9%, n= 50).

In a nutshell, it can be concluded that the amount of time the students spend on their smartphone is 3 - 6 hours daily, 30-44 minutes each time, and more than 40 hours weekly. The time spent each day is approximately a quarter of their daily time (25%). Thus, from the findings, it can be concluded the mobile addiction among the students is still at the moderate level. For the factors associated with the use of smartphones, students' mood has been identified as the major reason. The findings also indicated students usually use smartphones for internet and social media purposes. Even though the findings indicated that the students were somewhat addicted to smartphones, however, most of the time, they were using their phone for educational purposes.

Undeniably, mobile learning has many facilities such as online communication, posting questions, conducting online forums, and chat groups to motivate students. Chung, Subramaniam and Dass (2020) found that university students who do not ask questions in face to face lessons due to social stigma will become active learners in the online class. With the online communication of mobile phones, they can easily ask their friends or lecturers through the online platform. Furthermore, with the rise of Information Communication Technology (ICT), smartphones have added a huge platform for learning either formally or informally in higher education (Ismail & Shafie, 2019).

In fact, a study conducted at Concordia University of Portland Oregon found that a suitable and fitting school-use of smartphone will help students to learn comfortably, and access information more easily. Besides, the audio and video from mobile learning can make the lesson more interesting (Barrs, 2011). Hence, smartphones can be used as a learning tool to enhance social learning. Ng, Illiani, Mohammad and Malek (2017) also found that students who use smartphones for learning achieve higher productivity as information can be transmitted easily, even where there is no direct teaching involved. With the help of smartphones, some of the students have become independent learners. These learners were able to use their smartphone to search for more information whenever they needed it. However, Barrs (2013) suggested that a training and explanation session is necessary for guiding students to use their smartphones more appropriately during class. He even stated that meaningful learning can be achieved if smartphones are used in a more educational way.

In the education industry, smartphones provide a unique way to improve the quality of education. The use of the Internet has become a part of life for every student. The Internet together with the Smartphones provide an alternative channel to deliver education services such as distance education and online courses (Barrs, 2013). Without doubt, mobile phones can play a significant role in the development of information communication. However, excessive use of this technology will bring severe problems to the users' mental health, social interaction and time management. For example, the presence of a smartphone can disrupt bonding and intimacy relationships (Lepp, Barkley & Karpinski, 2014). To reduce these detrimental effects, people should always remember that mobile phones are simply a tool, not a master, and it should never be allowed to tamper with our productivity and interaction with the world in new and exciting ways. However, if smartphones are being used by the students in a proper way, it can provide more benefits especially in terms of their learning performance. Obviously, mobile technology has drastically changed the cultural norms and individual behaviour, the impacts are observed in both the positive and negative aspects. However, it is very much depending on the individuals themselves to control and minimize the negative impact of smartphones in the society.

4.   Conclusion

In this article, we found that most of the students somewhat agreed that they used smartphones without any compelling reasons. The findings showed that almost half of the students spent three to six hours a day on their smartphones. On average, they spent 30 to 44 minutes a day and more than 40 hours a week on their smartphones. The results showed the students were somewhat addicted to their smartphones. Most of the time, they were surfing the internet and the main factor to trigger them to use their phone was their mood. These findings have provided some insights for the higher learning institutions to better understand the pattern of smartphone use among the university students. Hopefully, these findings will help educational institutions to address the disruptive smartphone addiction behavior among the students. However, this study has two limitations to be addressed in the future study. The first limitation is due to the small sample size used in this study. Hence, the future study may involve more universities with a bigger sample size. The second limitation is caused by the quantitative nature of this survey that has limited the ability of this study to find reasons and more detailed information of problematic smartphone use behavior among the university students. This limitation can be addressed if a mixed method which consists of both quantitative and qualitative methods is used to provide a much more comprehensive understanding of mobile addiction and its impact on the students.

5.   Acknowledgements

6.   References

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