

The influence of mobile phone use on students' academic behavior in higher education

Chan Yuen Fook, Suthagar Narasuman

Faculty of Education, Universiti Teknologi MARA, Selangor, Malaysia

Article Info

Article history:

Received Nov 7, 2021

Revised Aug 16, 2022

Accepted Sep 8, 2022

Keywords:

Academic behavior

Mobile phone use

Students

Tertiary institutions

ABSTRACT

Smartphones have become an inextricable element of life in the twenty-first century. Since there is little research on the relationship between mobile phone use and academic behavior among students in local universities, hence, the current study sought to study the relationship between these two variables in the context of Malaysian higher education. The data from 435 students who answered an online Google Form of survey sent through a WhatsApp link was collected and analyzed using a descriptive correlational research approach. The results indicated that male students displayed a higher level of mobile phone use than female students in higher education. The study also found that negative phone use had a negative relationship with academic behavior, and positive phone use contributed to positive academic behavior. Regression analysis confirmed that excessive mobile phone use and mobile addiction had a higher impact on academic behavior, however, proper mobile use has a positive impact on academic behavior among the students in higher education. The study implies that all the universities need to have better guidelines to regulate the use of mobile phone in the classroom. Overall, the findings are useful in facilitating the monitoring of the proper use of mobile phone for enhancement of learning in tertiary institutions.

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Corresponding Author:

Suthagar Narasuman

Faculty of Education, Universiti Teknologi MARA

42300 Puncak Alam, Selangor, Malaysia

Email: suthagar@uitm.edu.my

1. INTRODUCTION

The advent of information and communication technology (ICT) and internet services has had a profound impact on nearly every aspect of human life. One of the advancements that it has brought into human aspect of life is in the way people share knowledge, teach, and learn. The consequences of the advancement of technology are vast and it has now turned smartphones as an integral tool in every human life. Obviously, people all over the world have embraced this innovative and fascinating technology as one of the most crucial essential facilities in their daily lives. The introduction of high-speed mobile internet connections, together with the expansion of smartphone technology, has contributed to the rapid expansion in the use of mobile technology. In the context of the local community, Malaysian mobile phone users have seen a significant increase in mobile usage. As reported by Rao [1], Malaysia has a mobile population density of more than 100% in 2012. A study by Google and TNS indicated that Malaysia statistically tops the world chart in terms of smartphone usage [2]. This study discovered that more than half of Malaysians engage their mobiles to listen to music, another half play online games, and 67% Malaysians watch online videos on their phones [2]. In addition, this ratio is predicted to grow to another 60% [3]. As a result, it is undeniable that mobile technologies, particularly smartphones and high-speed mobile internet, have now become ubiquitous.

Students engage their mobile phones for multiple purposes. This includes taking photos, updating social media, shopping and chatting online, playing games and so on which can affect their studies as they spend more time on their mobile phones. Some students are glued to their mobile phones due to the availability of these Internet facilities. If the students use smartphones typically for leisure rather than education, then smartphones may disrupt learning within academic settings [4]. According to the Malaysia Digital Association, Malaysians have become Internet addicts with more time spent online [5]. Overall, Malaysians spend more than five hours a day to search in the Internet, and almost three hours a day to browse through social websites, and nearly half of the Malaysians use their phone to surf the Internet. Today smartphone has become indispensable in our daily life. Research suggests that university students frequently use smartphones during class time despite rules against using it [6].

However, with the rapid development of smartphone technology, this device is also capable of enhancing student learning and academic performance because it can provide students with immediate access to many educational resources [7]. According to a study in Malaysia [8], university students in Malaysia are utilizing smartphones to exchange notes, publish test results on Facebook, and document lectures. Besides, a survey conducted among medical students [9] has shown that a large number of them use mobile phones as a tool to help them with their studies such as watching educational medical videos online. An analysis that examined several reports on the use of smartphones by students in tertiary institutions around the world, has shown that nearly every student at the university level owns a smartphone [10]. Thus, these findings have supported the latter discussion which proved that mobile phone usage has become widespread among university students and it has a tendency to affect the academic behavior of university students in the Malaysian context.

2. LITERATURE REVIEW

2.1. Mobile phone use and academic behavior

Even though smartphones have become a vital tool for students in class and for studying, there are not many investigations on the relationship between smartphone use and academic performance, especially in the Malaysian context. An early study [11] on Spanish high school students has identified that intensive smartphone use will lead to poor academic results and expose students to the negative habits such as smoking and alcohol use. Besides, a more recent study in the United States [12] has identified an influence of calling and texting on academic results of university students. Similarly, a study in Taiwan university [13] also found that calling and texting have caused academic negligence among a group of female students.

In the context of mobile phone use and the student's academic behavior, Horwood and Anglim [14] have found that an extensive amount of time spent using smartphone can contribute to much regular task switching between device and learning for students. Task switching is the condition whereby students are learning and using mobile phone at the same time. Both tasks mentioned earlier have been recognized as contributing factors which are able to decrease the overall achievement of grades among students. As a result, the high frequency of smartphone use can be risky to the students, especially if a person exhibits obsessive tendencies toward their smartphone. Two previous studies found that the majority of students surveyed tend to use smartphone for entertainment rather than for educational purposes [15], [16]. Smartphones are commonly used for leisure, it has a high tendency to distract learning in class and leads to multitasking [17] and task-switching [18], which will dampen academic results. In fact, Giunchiglia *et al.* [19] has indicated that social media is actually detrimental to students' performance. This is because social media contains enticing and emotive aspects which can draw student's attention towards it. Rozgonjuk *et al.* [20], for example, had discovered that most students who use their social media during lectures will result in the problematic smartphone use and procrastination in academic performance. In addition, a recent study [21] had discovered a close relationship between the frequent use of WhatsApp, Facebook and other social media with smartphone use disorder. These types of disorders are usually caused by the situation called fear of missing out (FoMo).

Nonetheless, there are always two sides of the same coin. Previous research has found that mobile usage can result in both a positive and a negative impact on the students in terms of academic behavior. For instance, Ophir, Nass, and Wagner [22] found that while studying, most students tend to browse through social media websites and sending messages. This has resulted in divided attention and a shift in focus away from the primary activity which is the learning activity [23]. Despite of the negative impacts of social media use in the previous research, a recent study has revealed that using social media does not always have negative repercussions for students [24]. A positive association is also observed when social media is used for proper educational aims [25]. It has been shown, for a fact, that using appropriate social media to communicate can improve motivation, participation, and learning satisfaction [24]. As a result, a study [24] concluded that there may be potential benefits when social media applications were used for learning purposes. However, when it is used for non-academic purposes, academic results will be affected.

2.2. Mobile phone use and gender difference

To date, there is much evidence indicating different patterns of internet activities and smartphone usage between males and females. In 2005, it was found that 72% of American male users used mobile phone mainly to play games. On the other hand, women were more often using these facilities for social purposes such as shopping, communication, and emergency needs. However, men were more often using smartphones for office work, news updates, and entertainment [26]. The literature attests that males were more likely to be embroiled in problematic use of digital gadgets and the internet.

Nevertheless, Bianchi and Phillips [27] found that there was no significant difference between males and females in smartphone use, even though males and females may profess different preferences in terms of usage. In fact, the problematic use of digital media is marked by gender differences due to biological, psychosocial, and sociocultural differences [28]. Females tend to visit social networking sites more often than males, while comparatively, males spend more time on their smartphones than females [29]. Weiser [30] identified that males tend to use smartphones for entertainment, while females tend to use their smartphones largely for communications. It was also found that internet usage among females is growing with time. This study also found that females often use the internet for a myriad of interpersonal communication and gathering information compared to males. In summary, males seem to expend more time on the internet for relaxing activities and searching sites related to romance and porn.

2.3. Theoretical framework

The existing researches shows that there are two possible relationships, either positive or negative between the smartphone use and academic behavior. Since smartphones have many useful functions, it will lead to better academic results if they are used for the right reasons. Smartphones' mobility features allow students to access the unlimited internet-based services and resources whenever they need it [31]. Easy accessibility to these facilities offers students access to a multitude of educational resources. Thus, smartphones with multimedia features are more versatile than a text-book [32]. Furthermore, the proper use of the various functions of the smartphones will facilitate sharing of relevant information and ensure better communication between students and lecturers [33].

However, many studies found that students have a higher tendency to use smartphones for entertainment than for learning purposes [17]. These outcomes back the idea of a fine balancing act between time spent using smartphones and time utilized for learning activities. In summary, time spent on smartphones is time that is lost for learning activities. Smartphone addiction could engender a negative bearing on their academic performance. Learning requires undivided attention however the continued use of smartphones and multitasking between applications leads to the inadvertent acquisition of habits that are derivative to focused behavior. A growing body of literature [18], [34]–[36] has highlighted the negative effect of smartphone use on students' academic performance. Essentially, there are four probable causes for this multitasking or task-switching behavior.

Firstly, visual and auditory notifications on the smartphone may distract students' concentration during class or learning activities [18]. Secondly, the craving not to lose out on online events and to continuously interact with the rest of the world (labelled as 'FOMO', fear of missing out) may lead to poor academic results [37]. Thirdly, engaging smartphones during learning activities may lead to addictive behavior and cyberslacking, which has a tendency to disrupt personal (online) life during learning activities [36]. Eventually, in the face of declining academic motivation and dreariness for learning, these students will seek a way out by embracing smartphone applications for a fast and tempting escape [35]. Based on the discussion, it is reasonable to believe that there is a correlation between university students' smartphone use and their academic behavior. Undeniably, smartphones can be a supportive instrument to enable quick access and immediate communication in the academic setting. However, the probable negative effects of smartphones are notably distraction, multitasking, and/or task switching have been dominantly advanced in the literature to date. Based on the reviewed literature, this study aims to satisfy the following objectives: i) To determine the overall mean for the constructs of mobile phone use, and academic behavior among tertiary students; ii) To identify any significant difference in mobile phone use between male and female students in tertiary education; iii) To identify any significant relationship between mobile phone use, and academic behavior among tertiary students; and iv) To identify the relative contributions of the mobile phone use towards the variation score of academic behavior among tertiary students.

3. RESEARCH METHOD

The purpose of this study was to determine the relationship between mobile phone use, and academic behavior among tertiary students using a quantitative research methodology. In a cross-sectional study, a descriptive correlational research design with a survey questionnaire was found appropriate for

evaluating the correlations between these two factors [38]. Using a simple random sampling method, a sample of 435 college students in a tertiary institution have been selected to participate in the survey questionnaire. Participants were taken from two public universities in Selangor, one is a research university and the other is a comprehensive university, and the all of these students own a smartphone. In this study, the levels of mobile phone use were determined using items adapted from a prior study [39]. 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” [40]. The mobile phone use section has 30 items and is separated into three categories: mobile addiction, positive mobile phone use, and negative mobile phone use. On a 6-point Likert-type scale, respondents indicated the statement in which they agreed with their mobile phone usage in the preceding six months (1=Strongly disagree, 2=Disagree, 3=Somewhat disagree, 4=Somewhat agree, and 5=Agree, 6=Strongly agree).

However, academic behavior has been defined as a set of academically desirable behavior leading to academic performance [41]. The newly developed construct of academic behavior was adapted from past studies [42], [43]. This academic behavior construct has a total of 20 items. It is divided into two categories of positive academic behavior and negative academic behavior. 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 behavior had been affected by smartphone use in the past six months. A higher mean score would reflect a more desirable academic behavior.

A pilot test has been conducted to ensure the validity and reliability of the instrument. 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. Besides, 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 (.896), negative mobile phone use (.786), and positive mobile use (.776) and the overall mobile phone use (.906) were deemed reliable measures (Table 1).

Besides, the Cronbach Alpha values for positive academic behavior (.705), negative academic behavior (.835) and overall academic behavior (.815) have also been identified at high levels as shown in Table 2. 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.

The data was gathered through Google Form and the access was shared with participants through WhatsApp groups. The collected data were analyzed with SPSS version 20, and descriptive statistics like mean and standard deviation were used to explain the variables of mobile phone use and academic behavior. Meanwhile, inferential statistical methods such as independent sample t-test was used to determine any significant differences in mobile phone use between genders, and correlation and multiple regression were crucial to identify the relationship between mobile phone use and academic behavior.

Table 1. Reliability index of the constructs of mobile phone use

No.	Constructs	No. of items	Cronbach’s alpha
1.	Negative mobile phone use	5	.786
2.	Positive mobile phone use	8	.776
3.	Mobile addiction	17	.896
	Overall Mobile Phone Use	30	.906

Table 2. Reliability index of the academic behavior

No.	Constructs	No. of items	Cronbach’s alpha
1.	Positive academic behavior	8	.705
2.	Negative academic behavior	10	.835
	Overall academic behavior	18	.815

4. RESULTS

4.1. Demographic factors of the study

Table 3 shows that most varsity students were female (n=334) followed by male students (n=119). In terms of ethnicity, most of the respondents were Malays (n=330), followed by ethnic Chinese (n=39), ethnic Indians (n=30) and lastly other ethnic communities (n=54). With regards to age of the respondents, the highest range was 18-22 years old (n=275), and the lowest range were respondents from the age of 53 and above (n=2). The following demographic questions relate to respondent’s education background and status. The highest percentage of respondents were from the Diploma level (n=296) while the lowest number of

respondents were from master's degree groups with amounting to 17 respondents. Next, regarding the student's status, the results showed that most respondents were full-time students ($n=411$), followed by part-time students ($n=39$) and the least number of respondents were not a student ($n=3$). Lastly, the section ended with a question asking whether the respondents are using their smartphone daily and almost all of the respondents answered Yes ($n=451$), and only very few answered No ($n=2$).

Table 3. Demographic analysis of respondents ($n=435$)

Variable		Frequency	Percentage
Gender	Female	334	73.7
	Male	119	26.3
	Total	453	100%
Ethnicity	Malay	330	72.8
	Chinese	39	8.6
	Indian	30	6.6
	Others	54	12.0
	Total	453	100%
Age	18-22	275	61.4
	23-27	124	27.7
	28-32	13	2.9
	33-37	7	1.6
	38-42	17	3.8
	43-47	7	1.6
	48-52	3	0.7
	53 and above	2	0.5
	Total	448	100%
Education level	Diploma	296	65.3
	Bachelor's degree	140	30.9
	Master's degree	17	3.8
	Total	453	100%
Student status	Not a student	3	0.7
	Full time student	411	90.7
	Part time student	39	8.6
	Total	453	100%
Use smartphone everyday	No	2	0.4
	Yes	451	99.6
	Total	453	100%

4.2. Measurement of mobile phone use constructs in higher education

Table 4 presents the descriptive analysis of mobile addiction, positive mobile phone use and negative mobile phone use among university students. The first-dimension measures respondents' perception of their mobile phone addiction. It was identified that the students somewhat disagreed with items that point to their mobile addiction ($M=3.41$). The second dimension looks at positive mobile phone use among the students. It is found that the students somewhat agreed ($M=3.91$) with the items that stated mobile phones can have a positive impact on users. The third-dimension measures negative mobile phone use. This dimension consists of questions that measure the negative impact of using mobile phones from the students' perspective. It is found that most of the students agreed ($M=4.25$) that mobile phone use can have a negative impact on university students. Overall, the items show that the students have a moderate level of mobile phone use experience ($M=3.68$).

Table 4. Measurement of the constructs of mobile phone use ($n=435$)

Mobile phone use experience	Mean	Standard deviation
Mobile addiction (Item 12 to 30)	3.41	.90
Positive mobile phone use (Item 6 to 11)	3.91	.82
Negative mobile phone use (Item 1 to 5)	4.25	1.01
Overall mobile phone use experience	3.68	.73

4.3. The difference of mobile phone use between male and female students

The findings in Table 5 indicate that male students ($M=3.75$, $SD=.63$) have a higher level of mobile phone use than female students ($M=3.61$, $SD=.69$). The Levene test ($F=.002$, $p>.05$) confirmed that the homogeneity of variance has been fulfilled, $F=.002$, $p>.05$. The t-test results indicate that there is a significant difference in the mobile phone use based on genders, $p<.05$, $t(451)=2.410$. It is thus concluded that male students have a higher tendency of mobile phone use than female students in higher education.

Table 5. Independent samples t-test of mobile phone use between male and female students

Variable	Gender	N	Mean	Std. Deviation	Std. Error mean
Mobile phone use	Male	119	3.8218	.75546	.06925
	Female	334	3.6351	.71477	.03911

Note: $t = 2.410$, $P < .05$ Levene Test ($F = .002$, $p > .5$)

4.4. Measurement of academic behavior constructs in higher education

The findings in Table 6 relate to the students' mobile phone use are further divided into two dimensions which are namely, positive academic behavior and negative academic behavior. The first dimension is positive academic behavior. This dimension measures positive behavior towards their academic needs. It is found that the students agreed on the items that express them to have a positive academic behavior ($M = 4.03$). The second dimension looks at negative academic behavior among the students. This dimension is to observe the student's perception on whether they have a negative behavior towards their academic needs. Data shows that the students somewhat disagreed ($M = 3.34$) that they have a negative academic behavior. The results showed that the students have a comparatively higher perception of positive academic behavior than negative behavior. Overall, the results indicate that the students have a moderate level of academic behavior ($M = 3.64$).

Table 6. Measurement of the constructs of academic behavior ($n = 435$)

Academic behavior	Mean	Standard deviation
Positive academic behavior (Item 1 to 8)	4.03	.77
Negative academic behavior (Item 9 to 18)	3.34	.91
Overall academic behavior	3.64	.69

4.5. Relationship between the constructs of mobile phone use and academic behavior

The Pearson's coefficient analysis was used to determine the relationship between the variables, (Table 7). The findings, $r = .540$, $p < .01$ suggests a moderate and very significant relationship between negative mobile phone use and negative academic behavior. Besides, mobile addiction is also moderately, positively and very significantly correlated to negative academic behavior. On the other hand, positive mobile phone use has identified a moderate and very significant relationship with positive academic behavior ($r = .479$, $p < .01$). Overall, mobile phone use has a moderate, positive and very significant relationship to academic behavior ($r = .655$, $p < .01$) among the students in tertiary education.

Table 7. Relationship between the constructs of mobile phone use and academic behaviors

Constructs	Positive academic behavior	Negative academic behavior	Academic behavior
Negative mobile phone use	.168**	.540**	.481**
Positive mobile phone use	.479**	.271**	.440**
Mobile addiction	.415**	.525**	.594**
Mobile phone use	.470**	.570**	.655**

*. Correlation is significant at the 0.05 level (2-tailed); **. Correlation is significant at the 0.01 level (2-tailed).

4.6. The predicting factors of academic behavior among university students in Malaysia

Table 8 shows the multiple regression analysis conducted to determine the predicting variables of mobile phone use towards the variance of academic behavior among university students in Malaysia. The independent constructs such as positive mobile phone use, negative mobile phone use and mobile addiction were entered into a multiple regression model to observe any significant prediction towards the academic behavior of university students. The findings of the analysis (Table 8) reveal that the negative mobile phone use ($Beta = .331$, $t = 8.897$, $p < .01$), and mobile addiction ($Beta = .375$, $t = 8.130$, $p < .01$) were identified to be the significant contributors towards the variance of academic behavior among university students in Malaysia.

Besides, positive mobile phone use does have some effect towards the academic behavior ($Beta = .176$, $t = 4.029$, $p < .01$). Overall, the results show that the highest value for the standardized coefficient for the variance is the mobile addiction with the beta value of .375. Hence, with every unit of increase in mobile addiction, it is expected that .375 points will affect academic behavior. This result is statistically significant at $t = 8.130$, $p < .01$. Besides, the negative mobile use beta value also indicated that every unit of increase in negative mobile phone use is expected to affect .331 units in negative academic behavior. The result was significant at $t = 8.130$, $p < .01$. These finding highlights that both mobile addiction and negative mobile phone use have a moderate impact on academic behavior among university students in Malaysia. The

result reports the R square value of .459, and this implies that 45.9% of the variance in academic behavior scores can be predicted with these three major variables of mobile addiction, negative mobile phone use and positive mobile use. Table 8 indicates the result recorded for each predicting factor dimensions' relationship.

Table 8. The predicting factors of the constructs mobile phone use towards the variance of academic behavior among university students (n=435)

Model	Unstandardized coefficients		Standardized coefficients	T	Sig.
	B	Std. Error	Beta		
1 (Constant)	1.133	.145		7.789	.000
Negative effect of mobile phone use	.224	.025	.331	8.897	.000
Positive effect of mobile phone use	.148	.037	.176	4.029	.000
Mobile addiction	.287	.035	.375	8.130	.000

a. Dependent variable: Academic behavior

Note: R²=.459, Adjusted R²= .455, F=126.961, p <.01

In brief, the regression formula (1) can be presented as:

$$Y=1.133 + .331X_1 + .176 X_2 + .375X_3 \quad (1)$$

Where, Y=academic behavior; X₁= negative mobile phone use; X₂=positive mobile phone use; X₃=mobile addiction

5. DISCUSSION

The discussion is conducted based on the research objectives of the present study which are: i) To determine the overall mean of mobile phone use and academic behavior; ii) To identify any significant difference in mobile phone use based on gender; iii) To identify any significant relationship between mobile phone use and academic behavior; and finally iv) To confirm the relative contributions of mobile phone use towards the variation score of academic behavior among higher education students in Malaysia.

The first finding looks at the overall means of the constructs of mobile phone use and academic behaviour. It is found that most students were reluctant to agree that they are afflicted by mobile addiction. This result does not support an earlier study [43], [44] which found that students especially, generation Z university students in the 18-23 age group are prone to mobile addiction. However, the students in this study somewhat agreed that mobile phone does have a positive effect, and they agree that excessive mobile phone will definitely bring higher negative effects than positive effects. Overall, the findings showed that the students have a moderate level of mobile phone use experience (M=3.68). These findings are aligned with previous studies which have found that mobile phone use can provide both positive and negative effects to its user. For example, a positive relationship has been observed when social media is used for proper educational aims [24]. Besides, the use of online educational materials will be able to motivate students to be more engaged in learning [23]. On the other hand, a study done by Berger [45] has found that overuse of mobile phone can cause high anxiety and a feeling of less happiness to its users especially if they are overusing it.

However, the students in the present study indicated that they have higher positive academic behavior than negative behavior. They somewhat disagreed that they have negative academic behavior. The overall mean of academic behavior indicated that the students have a moderate level of academic behavior. Sarwar and Soomro [46] who conducted a study on mobile phone use and academic behavior have also found a positive behavior of students towards mobile phone use because mobile phone can provide access to various learning resource and facilitate distance learning. However, it can also lead to negative academic behavior if they overuse it. For example, two previous studies in advanced countries [6], [46] have found out that overuse of mobile phone especially texting can distract the learning process and can cause the students to pay less attention during their lessons.

The second finding of t-test results in the present study indicated male students were significantly to have a higher tendency of mobile phone use than female students in higher education. This finding is supported by an earlier study [28] which found that the gender of the students can affect the level of mobile addiction among the students. Male students were found to be more exposed to mobile addiction than female students. Because they spend more time on their smartphones than females [30]. The study by Chen *et al.* [47] also found a different pattern of smartphone usage between males and females. Males were found to be more interested in entertainment types activities, whereas, females were more interested in using communication and social networking applications. However, in an earlier study, a different finding has been

found where women were more interested with the social functions of the mobile phone. Another study also indicated that men will normally use mobile phone to do office work and to relax their mind [25]. It is very different from women who are keen to use mobile phone to socialize with friends and family members [27].

The third finding of the correlation analysis indicated a moderate level of relationship that has been identified between mobile phone use and academic behavior. The findings indicated that “negative mobile phone use” and “mobile addiction” are associated with “negative academic behavior”, however, “positive mobile phone use” will lead to “positive academic behavior”. Overall, this study has discovered that mobile phone use has positively, moderately and significantly influenced academic behavior which is supported by two previous studies [43], [44].

The fourth finding of the regression analysis indicated that “negative mobile phone use” and “mobile addiction” have a higher impact than “positive mobile phone use” on the academic behavior of the students in higher education. These findings indicated that mobile users can bring both positive and negative impacts on the students in terms of academic behavior. These findings were supported by Hawi and Samaha [48] who discovered that students’ behavior will be influenced by the use of mobile phone. They found that overuse of mobile phones can negatively affect academic results and life satisfaction of students. These findings were supported by earlier studies [43], [48] which show that the overuse of mobile phones during lessons can lead to low academic scores among students as they are unable to recall much of the information delivered during lessons. However, Cochrane [49] in opposition to these findings, identified that positive mobile phone use enhances sharing of knowledge between teachers and students.

6. CONCLUSION

In general, the implementation of e-learning has been identified as an important part of higher education. There seems to be no denying that using a smartphone has benefits and drawbacks. In addition to its numerous positive usefulness, lack of awareness and overuse of mobile phone technology can lead to repercussions, including causing smartphone addiction and obsession, especially among young individuals in higher education institutions. Local educational organizations have taken a number of initiatives to address issues associated with smartphone dependency and usage. In brief, research on smartphone usage in the Malaysian setting is currently limited. There are not many studies have been conducted on smartphone usage among Malaysian students, activities on smartphones in learning, and research on students who are at risk of developing addiction behavior. Hence, it is suggested that in the future, a longitudinal study that focuses on causal interpretations should be conducted. Besides, it is also suggested that a mixed method that can counter the endogeneity problem and further explain the relationship of the variables as discussed should be adopted in future research.

ACKNOWLEDGEMENTS

The research team would like to acknowledge the Ministry of Higher Education, Malaysia and the Research Management Centre and Faculty of Education, Universiti Teknologi MARA, Malaysia for the research grant [Project Code: 600-IRMI/FRGS 5/3 (027/2019)] to sponsor this study

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BIOGRAPHIES OF AUTHORS



Chan Yuen Fook     is the Chief Editor of the Asian Journal of University Education (AJUE). He is also the Director of the Asian Centre for Research on University Learning and Teaching (ACRULeT) at the Faculty of Education, Universiti Teknologi MARA, Malaysia. His research interest includes educational management and e learning. He can be contacted at email: yuenfook@uitm.edu.my.



Suthagar Narasuman     is the Coordinator of Research Seminar for the Asian Centre for Research on University Learning and Teaching (ACRULeT) at the Faculty of Education, Universiti Teknologi MARA, Malaysia. He has been working in the educational sector as a teacher and lecturer for the past 35 years. His current research interest includes TESL methodology and e learning. He can be contacted at email: suthagar@uitm.edu.my.