International Journal of Engineering & Technology, 7 (4.38) (2018) 760-763

International Journal of Engineering & Technology

Website: www.sciencepubco.com/index.php/IJET

Research paper



Examining the Predictors of Mobile Addiction: Some Insights from Malaysia

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Abstract

This research aims to investigate the predictors of mobile addiction. The data was analyzed using Partial Least Square-Structural Equation Modelling (PLS-SEM) approach supported by Smart-PLS 2.0 to assess the hypothesis in the research model. The PLS-SEM technique revealed that there was a strong correlation between social networking sites (SNS) intensity and mobile addiction. Users have positively expressed that visiting SNS is part of their everyday activity as they tend to check their SNS almost every day. They have this perception that they will feel out of touch when they do not log into their SNS for a day. In addition, they feel as if they are part of the community of SNS on campus. Those with many SNS accounts have a strong tendency to install and use mobile social networking apps on their mobile phones to connect and communicate with others. These heavy users frequently use their mobile phone to log into their social network via preferred social networking apps and actively use it to check the SNS. The direction for future research is also presented.

Keywords: *Mobile Addiction, Social Networking Services (SNS), SNS Intensity, Partial Least Square-Structural Equation Modelling (PLS-SEM)*

Introduction

A dramatic evolution of mobile traffic on mobile applications (mobile apps) such as Facebook app is an accessible avenue for individuals to get connected with virtual communities, friends and family members in a real-time access from anywhere and at any time of the day. In actual fact, there are more than 2.07 billion monthly active Facebook users for Q3 2017[1]. Their active participation is significant, and this trend had changed the cultural norms and behavior of the consumers. This extreme usage of mobile phone leads to mobile phone addiction which has resulted in negative effects[2], and health risks such as sleep time disruption and brain damage[3].

Furthermore, He et al.[4] stated that the rate of mobile phone addiction among young people was higher than 30%. In a different study, Lopez-Fernandez and Freixa-Blanxart[5] discovered that the incidence of mobile phone addiction climbed up to 38% across cultures and societies with 62% possible addiction. These figures triggered detrimental consequences such as academic failure, lack of interpersonal skills, dejection, and fretfulness among mobile phone users[6-7].

However, empirical studies related to mobile phone addiction are scarce[8], particularly pertaining to developing country, and little is known about the predictors of mobile addiction. Hence, the goal of this research is to investigate the predictors of mobile addiction.

2. Literature review

Social networking services is referred to as "web-based services that allow individuals to (1) construct a public or semi-public profile within a bounded system, (2) articulate a list of other users with whom they share a connection, and (3) view and traverse their list of connections and those made by others within the system"[9]. However, excessive dependence on mobile phone will result in mobile phone addiction where individuals tended to suffer from discomfort and annoyance when some people are unreachable through their mobile phone[10].

On the other hand, social networking sites (SNS) intensity is referred to "the frequency of use and time spent on social networking services"[11]. Mobile phone addiction causes an individual to develop a high sense of attachment and interaction to a group with strong growth of friendship quality[12] which may affect their friends' lives[13-14]. Indeed, it has been reported that when there is a higher concentration of SNS, individuals have a tendency to receive more benefits from their online companionships[12].

Besides, mobile addiction causes negative consequences where it lessens human physical, psychological and social function, as well as conveys negative impacts and health risks such as stress, social extroversion, irregular sleeping time and brain damage[3,15]. In a similar vein, earlier scholars affirmed that depression, anxiety and stress are associated with mobile phone addiction[16-17]. Another study on the link between mobile phone addiction and shyness and among Chinese young adults, Han et al.[18] found a significant positive link between shyness, attachment anxiety, and mobile phone addiction.

In line with the research above, this study puts forward the following hypotheses:

H1: SNS intensity has a positive impact on users' mobile addiction

H2: SNS intensity has a positive impact on the use of the SNS mobile apps

H3: The Use of SNS mobile apps has a positive impact on users' mobile addiction

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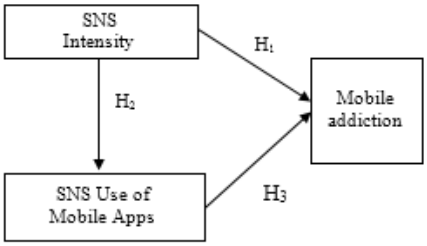


Figure 1: Proposed Theoretical Framework

3. Methodology

A quantitative research design was employed via the dissemination of a structured self-administered questionnaire to 300 students in a public higher learning institution in the Federal Territory of Labuan, Malaysia. The respondents were restricted to university students who own at least one mobile phone. After excluding the questionnaires that had not been correctly filled-up, 250 usable responses were attained for further analysis (valid response rate of 83%).

Section A of the three-section questionnaire covered the demographic characteristics of the respondents. Questions related to respondents' experiences of mobile phone usability were presented in Section B. The final section of the questionnaire, Section C, enclosed fifteen measurement items such as mobile addiction (5 items). The measurements for mobile addiction were partly adapted from Negahban[19], the use of SNS mobile applications (5 items) were adapted from Salehan and Negahban[11], and SNS intensity (5 items) were borrowed from Ellison et al.[20]. These measurement items were designed in five-point Likert-type scales ranging from 1 (strongly disagree) to 5 (strongly agree).

The data was analyzed using Partial Least Square-Structural Equation Modelling (PLS-SEM) approach supported by SmartPLS 2.0 to assess the impact of the SNS intensity, the use of mobile social networking apps and mobile addiction.

4. Data analysis

Table 1 displays the descriptive statistics of the respondents' socio-demographic profiles. A total of 250 students are involved in the study, with more participations of female respondents (52%) compared to the male respondents (48%). The majority of the respondents (80%) aged less than 21 years old. When asked about the frequency of using SNS mobile apps, the respondents report that they have access to the apps, less than twenty times in a day. Indeed, they mainly have less than 300 SNS friends and opt for Facebook than the competing SNS as a preference.

4.1. Partial Least Square-Structural Equation Modelling

The PLS-SEM approach was performed via a two-stage data analysis: measurement model and structural model. The measurement model was checked on the basis of the internal consistency reliability, convergent validity and discriminant validity of the measurement items. The reliability of the measurement items was tested via Cronbach's alpha and composite reliability.

Table 1: Demographic Profile of Respondents

Variables		Frequency	Percentage
Gender	Male	120	48.0
	Female	130	52.0
Age (years old)	≤ 19	13	5.2
	20-21	188	75.2
	22-23	42	16.8
	≥ 24	7	2.8
Frequency of using SNS mobile apps in a day (times)	≤ 10	35	14.0
	11-15	58	23.2
	16-20	113	45.2
	≥ 21	44	17.5
Number of SNS friends	≤ 100	63	25.2
	101-300	129	51.6
	301-500	34	13.6
	≥ 501	24	9.6
Most preferred SNS	Facebook	100	40.0
	Twitter	30	12.0
	Instagram	62	24.8
	Tumblr	6	2.4
	YouTube	52	20.8

The results of Cronbach's alpha and composite reliability for all the variables are in excess of 0.70 (see Table 2), which is indicative of the solid reliability of the measures.

Table 2: Reliability and Validity Analysis

Measurement items	Loadings	Cronbach's alpha	CR	AVE
SNS intensity				
Visiting social networking sites is part of my everyday activity	0.706	0.776	0.813	0.520
I check my social networking site(s) almost every day	0.772			
I feel out of touch when I haven't logged onto my social networking site(s) for a day	0.704			
I feel I am part of the community of my social networking site at the campus	0.701			
Use of SNS mobile apps				
I use the social networking application(s) on my mobile phone	0.778	0.745	0.855	0.663
I use my mobile phone to log into my social network	0.869			
I check my social networking site using my mobile phone	0.793			
Mobile addiction				
I feel lost when I do not have my mobile phone with me	0.763	0.787	0.862	0.610
I am obsessed with my mobile phone	0.737			
When I do not have my mobile phone I feel disconnected	0.834			
I feel uneasy in places where mobile phone usage is prohibited	0.788			

Notes: CR = Composite reliability; AVE = Average variance extracted

The convergent validity of the measurement items was evaluated based on the analysis of the factor item loadings and average variance extracted (AVE). Preceding research asserted that convergent validity would be achieved if the factor item loadings are over and above 0.70[21], and the AVE values are more than 0.50[22]. Table 2 indicates that all the factor item loadings surpass 0.70 and the AVE values are bigger than 0.50which signify that the measurement items are well connoted by its respective variables. Nonetheless, four items are cast-off ahead of time because their loadings are underneath 0.70.

Discriminant validity was evaluated by comparing the shared variance between the factors with the square root of the AVE of each construct[22]. A satisfactory discriminant validity exists when the latter is larger than the first. Table 3 illustrates that the shared variance between the factors is lesser than the square root of the AVE of each construct, endorsing the discriminant validity. Likewise, all the correlation coefficients are under 0.70, which uphold a satisfactory discriminant validity and the multicollinearity is elusive in this research[23-24].

Table 3: Inter-construct Correlations and AVE along the Diagonal

Variables	SNS intensity	Use of SNS mobile apps	Mobile addiction
SNS intensity	**0.721**		
Use of SNS mobile apps	0.442**	**0.814**	
Mobile addiction	0.570**	0.334**	**0.781**
Mean	3.888	4.250	3.696
Standard deviation	0.678	0.572	0.787
Skewness	0.878	0.720	0.611
Kurtosis	1.938	0.248	0.155

Note: ** Correlation is significant at the 0.01 level (2-tailed); The diagonal elements shown in bold are the square root of the average variance extracted.

The structural model was performed to examine the impact between the independent variables (i.e. SNS intensity, and the use of SNS mobile apps) and the dependent variable (i.e. mobile addiction) in the research model by utilizing a bootstrapping resampling technique with 500 sub-samples. Table 4 displays the results of the path estimates and *t*-tests of the structural model. More pre-

cisely, support is very strong for H1, which suggests that SNS intensity positively affects mobile addiction (β_1=0.524, *t*-value=16.055, p<0.05).

Table 4: Statistical Results of the Structural Model

Paths		Path Coefficients	Standard Error	*t*-value	Results
H1	SNS intensity ---> Mobile addiction	0.524*	0.033	16.055	Supported
H2	SNS intensity ---> Use of SNS mobile apps	0.473*	0.044	10.851	Supported
H3	Use of SNS mobile apps ---> Mobile addiction	0.035	0.050	0.695	Not supported

Notes: * p<0.05

In a similar vein, SNS intensity has significantly and positively affected the use of the SNS mobile apps (β_2=0.473 *t*-value=10.851, p<0.05), as postulated in H2. Hence, H2 is sustained. Further examination of the PLS path coefficient reveals that the use of SNS mobile apps have an insignificant impact on mobile addiction (β_3=0.035 *t*-value=0.695, p>0.05). These results signify that H3 is rejected, which is not within expectations. The total variance of each endogenous construct explained by the model is 37% for mobile addiction and 32% for the use of SNS mobile apps. Thus, verifying the model's predictive validity.

5. Discussion

This research examined the predictors of mobile addiction. Via the PLS-SEM approach, this study provided empirical support for H1; there is a significant relationship between SNS intensity and mobile addiction. Users' have positively expressed that visiting SNS were part of their everyday activity as they tended to check their SNS almost every day. They perceive that they will feel out of touch when they do not log into their SNS for a day. In addition to that, they feel that they are part of the community of SNS on campus. These results are analogous to previous studies. For instance, Norazah[25] and Norazah and Norbayah[26] avowed that users tended to feel lost and uneasy without having mobile phones with them over time as they treated the mobile phone as a significant belonging.

This study also recognized that SNS intensity had a significant and positive effect on the use of SNS mobile apps. Hence, H2 was upheld. The results implied that individuals with higher levels of SNS intensity have strong tendencies to install and use SNS mobile apps on their mobile phones to connect and communicate with others. Indeed, they heavily used their mobile phones to log into their social network via preferred social networking apps and actively checking SNS using their mobile phone. These findings supported prior research and are parallel to the outcome of Salehan and Negahban's[11] research.

A closer inspection of the path estimated results of PLS reveals that H3 was not supported because the influence of the use of SNS mobile apps on mobile addiction was not significant. This result is incomparable with the results of prior work conducted by Salehan and Negahban[11]. Users' have articulated that they tend to feel lost if they do not carry their mobile phones with them all the time as they were strongly attached to their devices. Likewise, they also felt disconnected when the said situation aroused. Most importantly, they felt apprehensive when mobile phone usage is forbidden.

6. Conclusions

In a nutshell, when referring to the path estimates of the structural model, this empirical research provides evidence that SNS intensity is found as the strongest significant predictor of mobile addiction (see Figure 2).

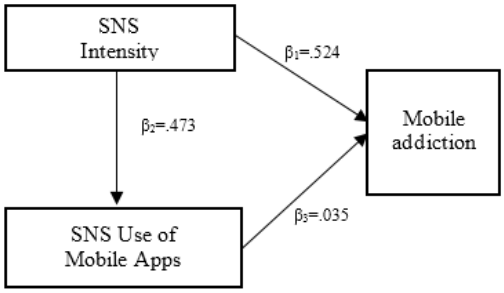


Figure 2: Results of Structural Model

In terms of the implication of this study, from academic perspectives, the present study adds to the understanding of the impact of SNS intensity to the users of SNS mobile apps on mobile addiction. It is suggested that for future research, the current research framework should be extended to include more constructs besides the moderating effects of gender. This can broaden our understanding of the mobile addiction among the male and female respondents. Earlier research documented that men are minimally addicted to mobile phones compared to women[27].

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