Internet Use and Addiction among Students in Malaysian Public Universities in East Malaysia: Some Empirical Evidence

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Abstract

Nowadays, the internet has become an essential part of daily life for most young adult. They mainly use it for education, information searching, entertainment, mail and social interaction purposes. However, extensive use of internet can lead to addiction. This paper presents some preliminary findings on internet use and addiction among Malaysian undergraduate students. A survey questionnaire was used to obtain data from 287 respondents who were business, information technology, and arts majors in four public universities in Sabah and Sarawak, East Malaysia. The findings revealed that facebooking / social networking was the most common internet activity among the respondents, whereas online shopping was the least common activity for them. The study also found that while the majority of the respondents spent a considerable amount of time on the internet, they did not qualify to be regarded as internet addicts. There was evidence of moderate gender effect in terms of internet addiction scores but not with regard to internet experience, frequency, and duration. On the whole, the findings are mixed, suggesting that internet use and addiction among Malaysian university

students remains a topic worthy of further investigation.

1. Introduction

The internet's influence on society is indisputably huge. With its remarkable capacity for high speed information flow across time and space, communication and trading across the globe via the internet has taken on a whole new meaning. The internet's educational values also render it an effective teaching and learning tool which has not only transformed but also enriched the way students acquire, share, and use knowledge within and beyond the classroom boundaries. With the weighty benefits, the internet has also brought along a myriad of problems such as internet addiction. Internet addiction can in turn lead to many ill effects including internet gambling, misuse of social media, and a myriad of other internet-related problems that can subsequently result in depression, suicides, and deaths (The Malaysian Times, 2013).

Addictive use of the internet is fast becoming a significant problem worldwide, and university students are particularly vulnerable for the reason that the internet is an integral part of student life. There is indeed a substantial amount of empirical evidence for internet use and addiction among university students in other countries (*e.g.,* Amichai-Hamburger & Ben-Artzi, 2003; Amiel & Sargent, 2004; Kim, LaRose, & Peng, 2009) but the body of identical research in Malaysia (*e.g.,* Balakrishnan & Shamin, 2013; Haghighi, Othman, & Hashim, 2011; Che Su, Noor, & Awanis, 2012; Ng, Saramah, Aili, Subash, & Kaur, 2012; Nurhilyana, Zaid, & Aminatul, 2013; Soh, Teh, Hong, Ong, & Charlton, 2013) remains limited. The majority of the Malaysian studies have tended to examine students' internet usage and skills as well as their perceptions towards using the internet for academic purposes. These existing studies have not systematically explored internet usage and behaviors of the student population in East Malaysia. Understanding students' internet use, behaviors, and motivations, and whether males and females are significantly different across the said dimensions is important. Such knowledge can benefit authorities, parents, and teachers who can be better equipped to guide youths' internet usage and help prevent them from falling prey to online risks and dangers.

Given the aforementioned, this paper focuses on student population who employs the internet extensively as a primary tool for information seeking and research work. The primary aim is to produce some preliminary findings on internet use and addiction among undergraduate students in East Malaysia. Toward this end, the paper investigates (1) students' internet usage pattern which includes internet experience, duration, frequency, and addiction; (2) the most/least common internet activity (*e.g.*, WWW, emailing, social networking, online gaming, etc.) among students; and (3) the differential effects of gender with regards to students' internet experience, duration, frequency, and addiction.

Sections two of the paper reviews the existing literature relating to internet use and internet addiction from Malaysia as well as that from other countries. Discussions in section three delve into the influence of gender on internet usage and its effects. The third and fourth sections present the methodology employed for data collection and analysis, respectively. This is followed by section five which discusses the findings in light of the research objectives. The paper concludes with some recommendations for future research.

2. Internet Use and Addiction

It has been recently reported that internet users in Malaysia have grown from 5.7 million in 2002 to 15.36 million users in 2009 (Malaysia Internet Users, 2012). The significant growth of Malaysian internet users is partly due to the provision of faster broadband by internet service providers in the country. In one study, Soh, Yan, Ong, and Teh (2012) revealed an internet penetration rate of 90 per cent among Malaysian urban youths. Given its easy and wide access coupled with its "seductive properties" (Leung, 2004), the internet can alter interpersonal behaviors including fostering addictive behaviors among its users. Thus, as the number of internet users increases at rather significant rates in Malaysia, the issue of internet usage pattern and addiction warrants close attention. Kapahi, Choo, Ramadass, and Nibras (2013) opine that given time, internet addiction may surface as a crucial problem in this country, particularly among the younger generation. Several studies in Malaysia have provided evidence of this problem; Haghighi et al. (2011) reported that approximately 63.3% of the students in one private university were excessive users of the internet. Similarly, Ng et al. (2012) found that about 49.2% of 19-year-old students was likely to be internet dependents. On the other hand, 2.6% of public university students were considered dependent on the internet (Hasmida, Zauwiyah, & Zauwiyah, 2011).

Albeit the absence of official statistics on the prevalence rates of internet addiction among Malaysians, we should never underestimate the impending threat of internet addiction to our society. Internet addiction has been consistently reported to result in unfavourable outcomes including internet gambling, misuse of social media, and a host of other internet-related problems that can subsequently result in depression, suicides, and deaths (The Malaysian Times, 2013). Negative outcomes of internet addiction among students are also found in the literature and they include reduced academic performance, psychological well-being, social involvement (Chou, Condron, & Belland, 2005; Sato, 2006; Young, 1996; Young, Pistner, O'Mara, & Buchanan, 1999), rise in university dropouts (Brady, 1997), and depression (Young, 1996; Young et al., 1999).

The existing literature consistently reports that longer internet use and extreme engagement in interactive functions are likely to contribute to internet addiction. Hence, a close examination of students' internet usage pattern (which may include their experience with the internet, the amount of time they spend online, and how frequent they go online) is clearly merited. Past studies (Haghighi et al. 2011; Hasmida et al., 2011; Nurhilyana et al., 2013) have in fact found that university students in West Malaysia spent a considerable amount of time online and they also went online rather frequently. This study hopes to gain more insights into these factors so that we can better understand students' internet use and addiction in East Malaysia. The current study also aims to ascertain the key internet motives among undergraduate students in East Malaysia. It has been argued that the internet itself is not addictive but some of its specific applications are (Chou et al., 2005). Those applications with interactive functions are particularly irresistible (C. Chou, J. Chou, & Tyan, et al., 1999; Chou et al., 2005; Kandell, 1998; Young, 1998). Young (1998) found that internet addicts are highly drawn to interactive functions such as chat rooms, games, newsgroups as opposed to non-addicts who tended to use information gathering functions such as WWW. Similarly,

Kandell (1998) reported that internet activities such as online games, internet relay chat (IRC), and chat rooms can lead to addictive behaviour, whereas Chou et al. (1999) and Chou and Hsiao (2000) found that excessive web surfing and checking email can result in overuse problems.

3. Gender Differences

The issue of gender in regard to the question of internet experience, use and its effects is one worthy of empirical investigation (Chou, Sinha, & Zhao, 2008; Soh et al., 2013). The influence of gender on internet activities and behaviors has been reported in past internet studies. Based on past work, we can conclude that males use the internet differently from females, and that males are more likely to become addicted to the internet. Innovation diffusion theory provides the theoretical basis for the effect of gender, whereby males are said to be more interested in technology (Shashaani, 1997) and are more likely to embrace a new technology (Gandy, 1994) when compared to females. While the bulk of past research (*e.g.,* Chou & Hsiao, 2000; Griffiths, 1998; Morahan-Martin & Schumacker, 2000; Scherer, 1997) provided sound empirical support for this theory, others did not. To elaborate, some studies (e.g., Jones, Johnson-Yale, Millermaier, & Perez, 2009; Schumacher & Morahan-Martin, 2001) found male students to have significantly more years of online experience when compared to female students. However, another study found no gender influence among younger students when compared to older students (Gross, 2004). This may indicate the narrowing of gender gap in internet experience as society becomes exposed to the internet at a younger age (Fallows, 2005; Soh et al., 2013).

In terms of internet addiction, the literature mainly suggests that males are more likely than females to become hooked on the internet. For instance, in Scherer's (1997) study, internet dependents comprised a significantly higher proportion of males than females (71% males and 29% females) when compared to non-dependent users (50% are men and women). Morahan-Martin and Schumacker (2000) similarly found that male internets users have higher tendencies to become internet addicts than do their female counterparts (12% vs. 3%). However, these findings are not supported by other studies. For example, Brenner (1997) reported that males and females were not significantly different in either time online or outcomes experienced. Similarly, other studies did not find gender differences in the overall amount of time spent online for Singaporeans (Teo & Lim, 2000), Americans (Fortson, Scotti, Chen, Malone, & Del Ben, 2007; Jackson, Ervin, Gardner, & Schmitt, 2001), and Germans (Wolfradt & Doll, 2001). The inconsistent findings have been attributed to the methodology used (Griffiths, 1998).

On the Malaysian front, little is known about gender differences in internet use, motivations, and addiction within the student population (Soh et al., 2013). One Malaysian study (Soh et al., 2013), however, found that males used the internet more than females in terms of both frequency and duration, and the former are more likely to be internet addicts. The study also reported gender differences in internet motives such that females are more motivated by, social-interaction, information/surveillance and shopping, whereas males are motivated by eroticism. These findings are largely consistent with previous studies in western countries

(*e.g.,* Joiner el at., 2012; Lenhart, Madden, & Hitlin, 2005). However, Malaysian males and females are found to have equal motivations to use the internet for entertainment. This finding is in contrary to that of most studies that reported males are more likely to be motivated by entertainment gratification (Joiner et al., 2005; Palesh, Saltzman, & Koopman, 2004; Park, 2004; Wolfradt & Doll, 2001). Further, Young (2008) reported that males are likely to seek out dominance (via interactive online games) and sexual fantasy online. Whereas females who prefer anonymous communication which hides their real identity and appearance tend to be drawn towards the internet as an avenue to look for close friendships, comfort, and romance.

4. Data Collection

4.1 Method

The current study employed the convenience sampling method to collect data from February to April 2014. Through the help of contact persons in respective universities, 600 survey questionnaires were distributed to undergraduate students in 4 public universities located in Sabah and Sarawak, East Malaysia. It should be noted that the respondents volunteered for the study and that the questionnaires were administered and collected back on the same day. The respondents took 20 minutes on average to complete the survey. At the end of the survey period, we obtained 287 usable questionnaires, giving a response rate of 47.80%.

4.2 Instrument

The survey questionnaire is divided into 3 parts. Part A is concerned with the respondents' demographic information including gender, age, ethnicity, academic major, year of study, and whether they lived on- or off-campus. Part B seeks information on internet experience, internet activities and behaviors such as frequency (less than once a month to several times a day) and duration (less than 30 minutes to more than 4 hours daily), trouble got into as a result of internet use, and internet motivations (or reasons for using the internet, e.g., facebooking, messaging, looking for information for university projects/assignments, *etc.*).

The final section measures internet addiction scores using the 20-item Internet Addiction Test (IAT) scale by Young (1996). An example item on a 5-point Likert scale is "Life without the internet would be boring." This scale is preferred over others as it usefully distinguishes the levels of engagement and addiction. Failing to do so can result in an overestimation of the degree of internet addiction and the number of addicts (Charlton & Danforth, 2007).

4.3 Respondents

Table 1 presents the demographic information of the respondents. The sample was comprised of 104 (36.2%) males and 183 (63.8%) females. Their mean age was 21.7 years (*SD*=1.19). In terms of ethnicity, there were 133 (46.3%) Malays, 91 (31.7%) Chinese, 49 (17.1%) indigenous people of Sabah and Sarawak, and 14 (4.9%) Indians. The respondents were mainly second year students (142 or 49.5%), majoring in business (160 or 55.7%), information technology (117 or 40.8%), and other arts disciplines (10 or 3.5%). Most of them lived on campus (177 or 61.7%).

4.4 Analysis and Results

This section discusses the various statistical analyses conducted to answer the research questions. The results are presented in the following sections.

4.5 Internet Usage Pattern

Descriptive statistics were computed to explore the respondents' internet usage pattern which includes internet access location, access device, experience, frequency, duration, and motivations among the respondents. Table 2 has the results.

We can see in Table 2 that internet experience (or the number of years using the internet) among the respondents ranged from 0.5 year to 22 years (M=7.8; SD=2.9). The majority of them (262 or 91.3%) have been using the internet for 5 years and more. Some students (95 or 33.1%) appeared to be early adopters of the internet, as they reported having used the internet for 10 years and more. A total of 144 (50.2%) respondents accessed the internet at home, whereas 72 (25.1%) on campus. The remaining accessed the internet in other locations including a Wi-Fi hotspots and cybercafés. Even though the majority of them (271 or 94.4%) reported to have access to the internet via their mobile phones, they primarily used their PCs or laptops (197 or 68.6%) to go online.

Table 1. Respondents' Demographic Information

Demographic Information	Frequency	Percentage (%)
Gender		
Male	104	36.2
Female	183	63.8
Age		
<20 years old	8	2.8
20 – 24 years old	275	95.8
> 24 years old	4	1.4
Ethnicity		
Malay	133	46.3
Chinese	91	31.7
Indian	14	4.9
Other	49	17.1
Academic major		
Business	160	55.7
Information technology	117	40.8
Arts	10	3.5
Year of study		
First	70	24.4
Second	142	49.5
Third	73	25.4
Fourth	2	0.7

Residence		
On-campus	177	61.7
Off-campus	110	38.3

The majority of the respondents (208 or 72.5%) used the internet for several times in a day. Similarly, a significant number of respondents (115 or 40.1%) reported having spent more than 4 hours online on a normal day. About half of the respondents (138 or 48.1%) claimed that they have run into trouble due to their internet use.

With regard to internet motivations, it can be seen from Table 2 that facebooking/social networking emerged as the most common internet motivation for the sample. The least common internet activity is other activities that include online shopping. It should be noted that the second most common internet activity which the respondents engaged in was looking for information for university projects/assignments.

Table 2. Internet Usage Pattern

Internet usage pattern	Frequency	Percentage (%)
Internet experience (in years)		
<1	1	0.3
1-2	6	2.1
3-4	18	6.3
>5	262	91.3
Access device		
PC/Laptop	197	68.6
Mobile phone	78	27.2
Tablet	12	4.2
Access location		
Home	144	50.2
University campus	72	25.1
Wi-Fi hotspots	49	17.1
Other	22	7.6
Frequency		
Less than once a month	4	1.4
Once a month	2	0.7
A few times a month	5	1.7
A few times a week	21	7.3
About once a day	47	16.4
Several times a day	208	72.5
Duration		
Less than 30 minutes	5	1.7
30 minutes – 1 hour	18	6.3
1 hour – 2 hours	40	13.9
2 hours – 3 hours	61	21.3
3 hours – 4 hours	48	16.7

More than 4 hours	115	40.1
		Frequency

Motivations	
Facebooking or other social networks	272
Looking for information for university projects	244
Downloading, viewing or listening to movies/music	222
Messaging or online chatting	198
Emailing	186
Looking for information for non-work purposes	152
News	146
Online gaming	70
Getting to know new people with the intention of meeting them face-to-face	27
Other	14

4.6 Gender Differences

Tests of differences were performed to examine possible gender differences in terms of internet experience, frequency, and addiction. The results are discussed in turn in the following sections.

It should be noted here that prior to this, we performed a factor analysis for the 20-item Internet Addiction scale. The several attempts of factor analysis did not provide clear factor solutions. As such, a second order factor analysis using oblimin rotation was resorted to. The resultant solution was 2 clean factors, with 17 items loaded cleanly on Factor 1 while the remaining 3 items (item number 1, 7, and 17) on Factor 2. The second factor was subsequently dropped due to its unacceptable internal coefficient of .36. Another run of factor analysis involving the 17 items was performed, revealing a single factor of moderately high internal coefficient of .84.

4.7 Internet Experience

We conducted an independent-samples *t*-test to find out if male and female students differed significantly with regards to how long they have been using the internet,. The results in Table 3 show that males (M=8.11, SD=3.20) and females (M=7.70, SD=2.77); $t(285)=1.13$, p=0.26) were not significantly different in terms of their internet experience.

Table 3. Gender and Internet Experience

Internet experience	Mean	Standard deviation
Male	8.11	3.20
Female	7.70	2.77
T	1.13	
Sig (2-tailed)	0.26 (p>.05, not significant)	

4.8 Internet Frequence

The chi-square test for independence using a 2 by 2 design was performed to investigate whether male and female students were significantly different with respect to frequency in internet use. To appropriate the data for this analysis, the 6 categories of internet frequency were collapsed to 2 categories (i.e., 1=A few times a week or less; 2=About once a day or more). The results are shown in Table 4.

Based on the chi-square output, the assumptions of chi-square concerning the 'minimum expected cell frequency' have not been violated as all the expected cell sizes are greater than 5 (in our case greater than 11.60). The Pearson chi-square value is 1.87, with an associated significance level of 0.58. We can therefore conclude that the proportion of males was not significantly different from the proportion of females with respect to frequency in internet use.

4.9 Internet Frequence

Similarly, the chi-square test for independence using a 2 by 2 design was conducted to determine whether male students used the internet more intensely than did their female counterparts on a daily basis. The 6 categories of internet duration were regrouped to 2 categories (i.e., 1=<3 hours; 2=>3 hours). The results in Table 5 indicate that males were not significantly different from females in terms of the time they spent online. The assumptions of chi-square concerning the 'minimum expected cell frequency' have not been violated as all the expected cell sizes are less than 5 (in our case 44.93). However, the Pearson chi-square value of 2.26 was not of statistical significance (p=0.13).

Table 4: Gender and Internet Frequency

Gender	Internet frequency		Total
	< A few times a week	*> About once a day*	
Male	12.5 (13)	87.5 (91)	100
Female	10.4 (19)	89.6 (164)	100
Total	11.1 (32)	88.9 (255)	(287)
Chi-square	0.30 (p=0.58, ns)		

Note: p<0.01; ns=not significant; numbers in parentheses are frequency of internet use in each category.

Table 5: Gender and Internet Duration

Gender	Internet duration		Total
	< 3 hours	*> 3 hours*	
Male	49.0 (51)	51.0 (53)	100
Female	39.9 (73)	60.1 (110)	100
Total	43.2 (124)	56.8 (163)	(287)
Chi-square	2.26 (p=0.13, ns)		

Note: p<0.01; ns=not significant; numbers in parentheses are duration of internet use in each category.

4.10 Internet Addiction

An independent-samples *t*-test was conducted to compare the internet addiction scores for male and female students. No significant difference in scores for males (*M*= 2.93, *SD*=0.60) and females (*M*=2.80, *SD*=0.64); *t*(285)=1.71, *p*=0.09) was found at 5% of significance level. However, at 10% significance level, we can conclude that males and females were significantly different with regards to internet addiction scores with males reporting higher scores. The eta squared statistics for effect size revealed that the magnitude of the differences in means was moderate (eta squared=0.51).

Table 6. Gender and Internet Addiction

Internet addiction	Mean	Standard deviation
- Male	2.93	0.60
- Female	2.80	0.64
T	1.71	
Sig (2-tailed)	0.88*	

*Note: *significant at 10% level.*

5. Discussion and Conclusion

University students are particularly vulnerable to internet addiction for the reason that the internet is an integral part of student life. A substantial amount of research on internet usage pattern and internet addiction among university students can be found in other countries. However, Malaysian studies remain limited, particularly those in East Malaysia. To address the research gap, this preliminary study was undertaken by targeting the student population in 4 public universities in Sabah and Sarawak.

The first objective of the study is to explore students' internet usage pattern which includes internet experience, duration, frequency, and addiction. The study found that the majority of the respondents had more than 5 years of internet experience. Having been informally exposed to the internet at an early age, there were some respondents who can be considered early adopters of the internet. The respondents not only spent a considerable amount of time online but they also went online rather frequently. These findings are consistent with those of other Malaysian studies (e.g., Haghighi et al., 2011; Hasmida et al., 2011; Nurhilyana et al., 2013). The findings are not at all surprising since GenYers are generally technologically savvy and are known to be constantly checking their email messages, facebooking, and engaging in online games. Further, ICT classes are offered as part of the curriculum in some secondary schools in Malaysia (Teck and Lai, 2011), thus exposing this generation formally to the internet at a young age.

Another noteworthy finding is that the students' internet addiction scores were rather high. But following Young's guideline (1998), these scores did not qualify them to be regarded as addicts. This finding supported the assumption of a report by Nielsen (2011) such that the most active internet users (who more likely to be dependent on the internet) are those within the ages of 15 and 19. Ng et al. (2012) also opine that younger adolescents are more likely to become internet addicts than any other age groups. Moreover, university students typically

have to meet tight deadlines for their class projects and assignments, and as such could be using the internet more for academic purposes than for pleasure.

While it has been argued earlier that students generally employ the internet as a primary tool for work purposes, it is reasonable to assume that the students may also be motivated to use the internet for non-work purposes such as facebooking, online gaming, and chatting. This study found that facebooking/social networking was the most popular internet activity among the students, followed by looking for information for university projects. These findings supported Young's (1998) proposition such that internet users tend to be drawn to more interactive applications such as online games or social networking sites than information gathering functions such as WWW.

On the contrary, online shopping was found to be the least common internet activity among the respondents. Similarly, a study by Toh (2011) on Malaysian GenYers' online shopping behaviors indicated that over 69% of the respondents have had no online purchase experience. The above findings contradict Evans' (2010) view such that GenYers are more financially optimistic than average online buyers, and as such may engage more in online shopping. That being said, it is reasonable to assume that online shopping could still be a rare phenomenon among undergraduate students when compared to postgraduate students or working adults who are financially better off. It has also been reported that consumers in Malaysia generally still lack confidence and trust in using the internet to purchase goods and services (Harn, Khatibi, & Ismail, 2006).

The third objective of the paper is to determine whether gender differences exist along the dimensions of internet experience, duration, frequency, and addiction. The data did not provide support for gender effects for the first three dimensions namely internet experience, duration and frequency. To elaborate, males and females did not differ significantly with respect to their internet experience. These findings did not provide support for several past studies which reported that male students have significantly more years of online experience when compared to female students (Schumacher & Morahan-Martin, 2001; Jones et al., 2009). However, they appear to support more recent literature on the fast appearing digital gender gap (e.g., Fallows, 2005; Hung, 2003; Kuo, Choi, & Lee, 2002; Lenhart et al., 2005; Malaysian Communications and Multimedia Commission, 2005; Ono & Zavodny, 2003).

This study also found that males and females were neither significantly different in the time they spend online nor the frequency of internet use. While these findings are inconsistent with those of a Malaysian study (Soh et al., 2013) and others (*e.g.,* Joiner et al., 2005; Jones et al., 2009; Li & Kirkup, 2007), they concur with several other studies (e.g., Brenner, 1997; Fortson et al., 2007; Jackson et al., 2001; Teo & Lim, 2000; Wolfradt & Doll, 2001) which did not find any gender differences in the overall amount of time spent online.

Collectively, the findings on gender differences may be an indication of the narrowing of gender gap in internet experience, as society becomes exposed to the internet at a younger age (Soh et al., 2013). The narrowing or even the disappearing of digital gender inequality has been reported in the U.S. (e.g., Fallows, 2005; Ono & Zavodny, 2003), and in some Asian countries namely China (Hung, 2003), Singapore (Kuo et al., 2002), and even Malaysia

(Malaysian Communications and Multimedia Commission, 2005).

Interestingly, there was evidence of gender effect when it comes to internet addiction scores. Male students were found to have scored higher on the internet addiction scale when compared to their female counterparts. These findings are mainly consistent with several past studies *(e.g.,* Deng, M. Hu, G. Hu, Wang, & Sun, 2007; Morahan-Martin & Schumacker, 2000; Scherer, 1997; Soh, Murali, Shingi, & Chew, 2007; Soh et al., 2013). Male are more likely than female to be pathological Internet users and to use technologically sophisticated sites. (Widyanto & Griffiths, 2006).

These preliminary findings could provide the impetus for more internet research in East Malaysia. The interpretation and generalization of these findings, however, should be done with caution as data were collected via self-reports from a sample that constitutes only a fraction of Malaysian youth. Future studies should consider a more expansive sample which covers a wide range of tertiary institutions including private universities in other parts of the country. Future research should also consider the use of focus group and face-to-face interview for richer and more reliability data on internet use and addiction among university students. As the internet becomes increasingly influential in Malaysia,   it is clearly here to stay. Hence, more internet studies are needed to provide knowledge that will enable us to shape and utilize the internet as a positive medium (Amichai-Hambuger & Ben-Artzi, 2003) particularly for the group that is most vunerable i.e., Malaysian university students.

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