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Research paper

An Investigation of University Students' Awareness on Cyber Security

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Abstract

The emergence of various online applications and abundance of exposure to the use of social media nowadays had put users in higher potential to online related risks. Racial abuse, cyber-bullying, online fraud, addiction towards gaming and gambling and pornography are among the risks that online users may be exposed to in their daily life. To protect oneself from these risks, it has to come from self-awareness. This research aims to investigate university students' awareness of cybersecurity. Research data was collected using a set of questionnaire to 142 second-year students in the faculty of education in one of the universities in Malaysia. Descriptive data analysis was done using an SPSS software. The result of this study showed that even though these university students demonstrated a high level of awareness on certain elements in cyber security such as cyber bully, personal information, and internet banking, there are still lacking appropriate knowledge on the aspect of cyber-sex and self-protection. This paper also discusses the role of all level of community in educating children and young adults in this matter.

Keywords: *Awareness; addiction; Cybersecurity; cyber risks; tertiary education; online;*

1. Introduction

It is an undeniable fact that the existence of the Internet and digital media had changed the way people learn, retrieve information and construct knowledge [1], [2]. Digital media has provided a new dimension through which we communicate and participate in our communities and societies [3]. Although the Internet is considered as the most valuable innovation ever created in this world, it also has a dark side that may result in negative effects on the users including adults and children [4]. Among the potential cyber risks are: cybersex [5], pornography [5], [6], personal information exposure [7], [8], [9], cyber addiction [10], online fraud, addiction towards gaming and gambling [6].

In Malaysia, there are 21,056,126 Internet users in Malaysia, out of its whole population of 31,545,990 [11]. According to the Malaysian Council for Child Welfare (MKMM) has recently reported the occurrence of suicide and self-harm cases among youngsters due to cyberbullying as well as addiction to cyber gaming. Although these can be remote cases, but the fact that youngsters in this country are affected by the misuse of the Internet cannot be denied or ignored, as reported by [12], Malaysians spent an average of 5.1 hours per day on the Internet, and 2.8 hours a day on social networks. All these are the results of the lacks awareness of potential risks related to the Internet use and the aspects of cybersecurity [9].

Cybersecurity is defined as: […] the protection of cyberspace itself, the electronic information, the [Information and Communication Technologies] ICTs that support cyberspace, and the users of cyberspace in their personal, societal and national capacity, including any of their interests, either tangible or intangible, that are vulnerable to attacks originating in cyberspace [13]. [14] however, stresses that the process of cybersecurity has become the more human issue as it demands a human-centered approach rather than merely technical controls.

Although there were numbers of studies been conducted by other researchers particularly in this country on cybersecurity, for example [15] who explored the information security landscape in Public Services organizations in Malaysia, or [16] who focused on the recommendation of the policy to address the protection of national information against cyber terrorism in Malaysian government, there is little research has been done on identifying cybersecurity awareness among youngsters and young adults and how their guard their personal information [17]. Very little is known about the trends of Internet usage among youngsters and young adults and the level of their awareness towards the risks they are exposed to when work online and their self-protection mechanism to prevent themselves from being the cyber victims.

Undergraduate students are classified under young adult i.e., who aged from 21 to 29 years old [18]. In higher education institutions, these young adults are active Internet users. They depend a lot on information seeking via the Internet and known to be users of social media too [3], [19] A long duration of time spent online can put university students as young adults in a vulnerable condition in which they are highly exposed to online risks as mentioned earlier. This research, therefore, aims to investigate university students' knowledge and awareness of cybersecurity.

2. Methodology

The study employed a survey research design involving 142 second-year students from the Faculty of Education who enrolled in the Innovation and Technology for Teaching and Learning course. Through this course, students were exposed to the development and evaluation of learning materials and the use of technology in enhancing teaching and learning. Cyber Security is one of the sub-topics that need to be covered in this course. In the previous semesters, students were supposed to read and seek information about the aspects of Cyber Security themselves and presented their findings to the class and knowledge sharing activity. However, for this semester, a different approach was taken so as to provide different experiences to the students. To achieve this, we worked closely with Malaysia Cyber Security, an agency that is in charge of Cyber Security issues in Malaysia and we asked them to send their officer to conduct a 3-hour talk. During the session, students were exposed to real stories of cyber victims, and the mechanisms on how to protect themselves when they work online. The objectives of the talk were to give students an exposure to the elements of Cyber Security and instill awareness among the students about the importance of protecting themselves from the online risks.

142 students were present at the event (46 male and 96 male students). Before the talk began, the students were given a set of questionnaire and asked to fill up the answers and they had to submit the questionnaire after the event. The questionnaire consisted of 6 sections – Section A covers respondents' demography, Section B consists of Cyber Bully, Section C on Cyber Sex, Section D on Internet Banking, and Section E on Self Protection. In Section B to Section E, participants were requested to indicate their agreement or disagreement with the statements based on a five-point Likert-type scale, from 'Totally Disagree' (1) to 'Totally Agree' (5).

The questionnaire was pilot-tested by 37 first-year students from the same faculty. The internal consistency estimate of reliability for items using Cronbach's coefficient alpha for the pilot test ranged from .81 to .90. As recommended by [20], these values surpassed the minimal consistency guidelines for an instrument to be judged acceptable. An SPSS software was used to produce a descriptive analysis.

3. Results and Discussion

The overall of 142 students from three programs took part in this survey. As shown in Table 1, out of this number, 96 students (67.6%) are female students and the rest are male students (n=46, 32.4%). The highest number of participants are from Sports and Recreation program (n=51, 35.9%) followed by TESL program (n=48, 33.8%) and Special Education (n=43, 30.3%).

Table 1. Respondent's demographic information

Variables	Sub-variables	n	%
Gender	Male	46	32.4
	Female	96	67.6
Programs	TESL	48	33.8
	Special Education	43	30.3
	Sports and Recreation	51	35.9
	Total	142	100.0

Awareness on cybersecurity

This research aims to investigate university students' awareness towards the elements of Cyber Security consisting of six aspects namely: cyberbully, personal information, cybersex, internet banking, internet addiction and self-protection. Table 2 summarizes the mean for each item. In terms of students' views on the aspects of the cyberbully, the analysis shows a high mean for each item in this construct. The highest mean was shown in the item "I think giving harsh comments to my friends on social media is not a good thing to do" (M=4.21, SD=.98), followed by the item "Although I felt unsatisfied with someone, I will never express it through social media" (M=4.02, SD=1.03) and "I will never express my anger to someone through social media" (M=4.02, SD= 1.53). However, interestingly, participants indicated a slight low mean for item "I think it is not acceptable to criticize someone when they uploaded their controversial photos" resulted in the lowest mean (M=3.98, SD=1.00).

Table 2. Means for cyberbully items

#	Items	n	Mean	S.D
1	Although I felt unsatisfied with someone, I will never express it through social media.	142	4.02	1.03
2	I think giving harsh comments to my friends on social media is not a good thing to do.	142	4.21	.98
3	I think it is not acceptable to criticize someone when they uploaded their controversial photos.	142	3.98	1.00
4	I will never express my anger to someone through social media.	142	4.02	1.53

The second element of cybersecurity is personal information (Table 3). The result revealed that as much as they are worried that their personal information might be misused by others (Item #5, M=4.61, SD=.79), or was not kept safely online (Item #7, M=4.01, SD=1.13); participants are also uncomfortable when my personal information was shared without their permission. This can be seen in item "I am not comfortable when my personal information was shared without my permission" (M=4.40. SD=.85). However, a lower mean was recorded for item "I will only provide my personal information when I was asked by the organization that I know well" (M=3.45, SD=1.27).

Table 3. Means for Personal Information items

#	Items	n	Mean	S.D
5	I am worried that my personal information might be misused.	142	4.61	.79
6	I am not comfortable when my personal information was shared without my permission	142	4.40	.85
7	I am worried if my personal information was not securely kept online.	142	4.01	1.13
8	I will only provide my personal information when I was asked by the organization that I know well.	142	3.45	1.27

There are three items to measure the element of cybersex awareness among the participants (Table 4). They have shown high means for both items "I will just ignore requests from any stranger who asked for my personal photo" (M=4.32, SD=1.29) and "I will delete or un-friend any person who sent me pornographic materials through social media" (M=4.25, SD=1.24). Nevertheless, a lower mean was shown for item "I will delete any pornographic materials once I received it" (M=3.22, SD=1.30).

Table 4. Means for Cyber Sex items

#	Items	n	Mean	S.D
9	I will just ignore requests from any stranger who asked for my personal photo.	142	4.32	1.29
10	I will delete or un-friend any person who sent me pornographic materials through social media.	142	4.25	1.24
11	I will delete any pornographic materials once I received it.	142	3.22	1.30

In relation to an aspect of internet banking, participants showed a high agreement on an item "I will not make any online purchase if I found the quality of the good is unreliable" (M=4.33, SD=1.07) which indicated them being careful about the quality aspect when

they purchase online (Table 5). Nevertheless, this is not enough to claim their literacy related to online banking. For example, for item "I will only make an online purchase after inspecting the seller's background", the mean is fairly highly (M=3.83, SD=1.16). Despite being selective in buying things of a good quality, this finding indirectly revealed that there are other aspects that participants need to improve in order to prevent themselves from being cyber victims. The similar situation can also be witnessed in item "I am worried when I received any suspicious online advertisement" (M=3.20. SD=.99) and item "I will provide my personal information whenever I received calls from banking organizations" (M=4.29, SD=.97). The findings suggest that there is a protection mechanism related to online banking that needs to be acquired by the participants.

Table 5. Means for Internet Banking items

#	Items	n	Mean	S.D
12	I will only make an online purchase after inspecting the seller's background.	142	3.83	1.16
13	I will not make any online purchase if I found the quality of the good is unreliable.	142	4.33	1.07
14	I am worried when I received any suspicious online advertisement.	142	3.20	.99
15	I will provide my personal information whenever I received calls from banking organizations.	142	4.29	.97

Internet addiction is another vital aspect surrounding the issue of cybersecurity. All items in this construct (Table 6) showed high mean scores that demonstrated a condition where participants might be highly likely to be addicted to the Internet use. The highest mean was shown for item "I would spend more time on social media than having outdoor activities" (M=4.90, SD=1.31), followed by item "I will be extra excited when I use the Internet" (M=4.89, SD=.77). Participants were found to have spent more time on social media compared to spending time on outdoor activities (Item #16, M=4.90, SD=1.31). They also reported being extra excited whenever they used the Internet (Item #17, M=4.89, SD=.77). Participants also had a high degree of agreement on the statement that "The time spent without surfing the Internet is the most boring moment" (M=4.35, SD=1.29) and "Without the Internet, there is nothing I can do" (M=4.35, SD=1.29).

Table 6. Means for Internet Addiction items

#	Items	n	Mean	S.D
16	I will be extra excited when I use the Internet.	142	4.89	.77
17	The time spent without surfing the Internet is the most boring moment.	142	4.77	1.14
18	Without the Internet, there is nothing I can do.	142	4.35	1.29
19	I would spend more time on social media than having outdoor activities.	142	4.90	1.31

In the last section of the questionnaire, we wanted to check participants' self-protection when exposed to online risks. Based on the analysis done, it seemed that the means for each item were not as high as in the previous constructs. This indirectly portrayed an insufficient knowledge of self-protection aspect. These can be seen in the means for the items as indicated in Table 7 that ranged from 2.56 to 3.55. The lowest means were reported for item "I will not share my contact number to a person whom I newly know when asked" (M=2.56, SD=.81) and "I will inform my parents when my online friends want to meet me up" (M=2.92, SD=1.14). This indirectly disclosed that participants have a tendency to share their number with those they just recently get to know online. Apart from that, participants were not very sure about sharing their online friends with their parents. This might be in line with [21] who suggested that youngsters do not have concern too much on disclosure of their personal information to strangers online, but they are more concerned about being visible to their parents [21].

Table 7. Means for Self-protection items

#	Items	n	Mean	S.D
20	I will only add new friends to my social media after inspecting their background.	142	3.55	1.33
21	I think I will consider meeting my new online friend alone.	142	3.54	.66
22	I will not share my contact number with a person whom I newly know when asked.	142	2.56	.81
23	I will inform my parents when my online friends want to meet me up.	142	2.92	1.14

Looking at the cumulative means for each construct as summarized in Table 8, it can be concluded that participants as young adults in this study had shown a relatively high awareness on the aspects of cyberbully (M=4.05), personal information (M=4.11) and internet banking (M=4.15). However, there are few constructs that demonstrated a slightly lower means i.e., cybersex (M=3.99) and self-protection (M=2.89). With self-protection showing the lowest mean, it gives us an alarm that there are aspects that need to be addressed so as to educate these young adults with the more powerful mechanism in protecting themselves from online risks.

Table 8. The cumulative mean for each construct

Constructs	Cumulative mean	Standard deviation
Cyber Bully	4.05	0.89
Personal Information	4.11	1.12
Cyber Sex	3.99	1.12
Internet banking	4.15	1.07
Internet addiction	4.72	1.36
Self-protection	2.89	1.10

4. Conclusion

It is important to note that cyber awareness education is essential at every level of students, not only in primary and secondary school but it is also needed by the young adult like those in tertiary education. In order to disseminate the knowledge, various role players need to do their job and responsibility. The result of this study showed that even though these university students demonstrated a high level of awareness on certain elements in cyber security such as cyber bully, personal information, and internet banking, there are still lacking appropriate knowledge on the aspect of cyber-sex and self-protection. Although currently, there is a 'Klik Dengan Bijak' program [22] run by the Malaysian Communications and Multimedia Commission and 'CyberSafe' by CyberSecurity Malaysia [23] that focus on spreading the awareness of online risks to children, teens, and parents, it might not be sufficient to reach out and educate all of them. Therefore, in order to disseminate the knowledge to all level of community, various role players need to do their job and responsibility.

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