Assessing the Levels of Knowledge of Personal Data Protection among Students

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Article Info	Abstract
	Over recent years, the sharing of personal data among students is uncontrolled, especially on the social media networks, resulting in widespread data intrusions that compromise their privacy and confidentiality. Against this backdrop, this study was conducted to identify the level of knowledge of personal data protection among students. This research design of this study was based on a quantitative approach using a survey. The sample study was made up of 133 students at a public university in the state of Perak, consisting of 62 males and 71 females, aged between 17 and 24 years. The research instruments used were based on a set of multiple choice questions to gather information relating to their demographic and their levels of knowledge of personal data protection. Data were analyzed using descriptive statistics and an independent samples t-test. The former showed that the respondents' levels of knowledge of personal data protection were moderate, while the latter showed there was no significant difference in the levels of such knowledge between male and female respondents. Given this revelation, it is imperative for all stakeholders to increase the efforts to improve users' knowledge of personal data protection through either the formal education or informal education.

Introduction

Today, we live in a data-driven world in which data virtually pervade every facet of our lives, thus leading to increasing data intrusions that negatively have impacted many nations' economy (Forum Ekonomi Dunia, 2019). For example, Malaysia has witnessed an increase in cases of data intrusion by as much as 75% in 2020, a majority of which were related to data intrusion of the highest level. Surely, this could pave the way for many unhealthy activities to occur, such as cybercrime and identity forgery, which is becoming more prevalent with each passing year (Zulkufli & Azmi, 2019). Thus, the protection of data is paramount to users, especially personal data of students, who represented 84% of internet users worldwide, with 78% of the users being females (Pewresearch, 2021).

In this digital age, the privacy of students is increasingly being threatened by unscrupulous individuals who prey on their victims by amassing the latter's data. Such a problem is compounded by users' lack of concern about their safety or their indifference to the security of their personal internet activities. This is best exemplified by a

study conducted by (Vu et al., 2019) in several educational institutions in which they found the students were not concerned or worried that their online activities could be monitored and recorded. This finding is highly disturbing given that the protection of personal data is important to ensuring users' confidentiality and integrity are intact (Ciftci & Delialioglu, 2015; Hida & Muka, 2021; Sarıtaş et al., 2022; Simsek, 2022). Admittedly, social network services provide new opportunities for interaction, exploration, and information retrieval, but the privacy of users' online activities and personal data protection are not their main priority or concern (Vu et al., 2019). As such, users should be made aware of this lack of concern when they are online such that they conduct their activities carefully. Interestingly, the report of a survey of internet users conducted by the Malaysian Communication and Multimedia Commission (MCMC) (2020) in December 2020 found that only 47.0% of respondents felt safe when using the internet.

Essentially, internet activities can be divided into two (2) categories, namely social media and text communication. The former includes Meta (the new name for Facebook), Instagram, and YouTube, while the latter includes Telegram, WhatsApp, WeChat, and MiChat. Currently, YouTube, Meta, WhatsApp, and Tiktok are the popular social service networks among students, with each competing to be the top social media network (Gogus & Saygin, 2019).

For example, the popularity of Meta among Malaysian users dropped slightly from 97.3% in 2018 to 91.7% in 2020. By contrast, YouTube experienced a huge increase in popularity, climbing from 48.3% to 80.6% in the same two years as above. Likewise, a similar trend was also observed for Tiktok and Instagram (MCMC, 2020). Such findings are hardly surprising given the intensifying rivalry between these social media platforms in wooing internet users throughout the world, who numbered 4.5 billion in 2020, with 3.8 billion actively using the social media (Hootsuite, 2020). Hence, lies in the pertinent questions about a wide range of issues, such as "Which platforms are growing rapidly?", "What are their viewpoints about the privacy and protection of users' personal data?", "How many people are not aware of the importance of online privacy?", "How much data they are sharing on social networks?", and "What are the users browsing on the social media networks?"

Revealingly, a study by Lin and Wang (2020) showed there were significant gender differences in their perceptions on information sharing on social networking sites, with female users being more concerned about issues relating to privacy and commitment compared to the opposite counterparts. Several years earlier, a study by Livingstone et al. (2014) showed the levels of digital knowledge and skills of student users decreased slightly from 55% in 2014 to 43% in 2020. In terms of gender parity, it was observed that female users slightly dominated the social media landscape, the percentage of the former's at 24% compared to that of the latter at 22%. Moreover, several studies have shown that female users were more sensitive to issues relating to personal data protection (Kaur et al., 2016; Dhir et al., 2016; Dhir et al., 2017).

Alarmingly, in general, users' knowledge of the importance of protecting personal data remains low (Stoilova et al., 2021), especially that concerns the self-disclosure of interpersonal online communication of student users. Inadvertently, this could lead to the misuse of personal information for a wide range of illegal or unlawful activities, such as privacy intrusion, illegal sharing of information, abuse, hacking, and false declaration. By

contrast, the findings of a study conducted by (Youn & Shin, 2020) are interestingly revealing, indicating that 75.2% of higher education students had the knowledge to apply self-protection measures in social media. This revelation might be attributed to their high level of awareness of the importance of safeguarding personal information, as exemplified by 86.5% of the respondents asserting that the protection of personal information is a basic human right that must be respected.

Encouragingly, the findings of a study by Madden et al. (2013) showed 85% of student users practiced good habits when they were online, such as closing or removing their digital trails (such as cookies), encrypting emails, using pseudo-names, and browsing safe websites (with the internet protocol 'https://' to denote secure web pages). They also knew how to manage the sharing of contents for public view (by tweaking the privacy setting). Moreover, the findings of studies by Jia et al. (2015) and Murat et al. (2016) showed student users handled privacy issues quite differently from adult users, with the former cautiously taking a particular action and assessing the attendant consequence.

Another privacy issue is concerned with online applications that users have to fill out by disclosing their credentials, which can be preyed upon by hackers to steal users' personal information that can lead to a myriad of problems, such as online fraud, cyberbully, and phishing scam (Senthilkumar & Easwaramoorthy, 2017). Therefore, it is imperative for users to be made aware of the risk of such vulnerabilities that can be exploited by hackers or anyone with ill intentions (Garba et al., 2020).

Recently research about privacy and personal data protection studies vary hugely based gender as like as Tifferet (2019) about usage pattern with respect gender among students, Sheen (1999) mention about social role theory in computer culture is socially built as male and gender hypothesis solely based on previous studies (Youn & Hall, 2008). Weinberger et al. (2017) related on gender difference toward online privacy and personal data protection among students. Potential differences in level of knowledge and behavior between male and female among students have always been an interesting topic (Weinberger et al., 2017). In fact, the gap between the genders is a widely explored topic; however, the finding of the different studies seem to be debated and still exists (Tømte et al., 2011).

A number of studies result toward investigates gender differences associated with digital aspects found a consistent result in digital knowledge between men and women (Tifferet, 2019;Weinberger et al., 2017; Mesch & Talmud, 2011; Tømte et al., 2011; Weiser, 2000; Hargittai, 2002). Most studies reported that women have a positive perception towards ICT. Youn and Hall (2008) described that women more adopt social privacy protected with providing inaccurate information as their ability to retain privacy. The finding from Tifferet (2019) research showed that females have higher privacy concerns and are committed to enhancing privacy. However, personal information considered least sensitive was purchasing practices and media consumption lifestyles (Pewresearch, 2014).

Weinberger at el. (2017) related on privacy protection behavior, the protection of online privacy does not depend on technical knowledge or tool usage but they found that there are significant differences between genders. Further

analysis found that women's low lower ability to protect their identity and personal information but conversely research from Park (2015), women's ability to effectively manage. Early studies in internet and human behavior have shown a significant connection between social media use and sex (Hughes et al., 2012).

Women and student users have the highest expectations for integrity, trusting others and expecting others to show understanding and friendliness (Søderholm et al., 2018; Hughes et al., 2012). Will and Zeljkovic (2011) reported that women are more particular about privacy compared to men. But Hoy and Milne (2010) found that conversely. Women showed that women's low on technological online privacy literacy level gave an impact that a lower ability to protect their identity and personal information. Other studies indicated, there is no significant difference between gender in terms of concern about their privacy online (Vu et al., 2019) and but women have more to expose compared to men (Milne et al., 2005).

Acker & Bowler (2017), they already conducted qualitative and quantitative study using interviews and surveys for students, they were concerned about privacy but lacked knowledge about social media networks and protection of personal data. This study also found that student's women have high levels of ability to protect their identity and personal data but they have low levels of technological threat awareness. And they are aware but don't really pay attention to privacy and protection of personal data.

A recent study was conducted by Zwiling et al. (2020) who studied cyber security by comparison of four countries. The study was conducted to identify the relationship between awareness, knowledge and behavior among individuals. This study shows that understanding is directly proportional to an individual's level of awareness. This is consistent with Kimple et al. (2021) said individuals who have knowledge about online security have a perception of being less exposed to cybercrime and not a serious threat. However, Pewresearch (2019) studied Americans' understanding of digital technology such as phishing scam, website cookies and so on. It shows that only 28% can identify about two factor authentication and in general say they are not sure what the function of private browsing is. This study also shows that the knowledge of teenagers is better than that of adults. This shows how important it is to study the understanding of privacy and protection of personal data.

Moreover, previous study pointed out as general or mention about user lack of knowledge in privacy or personal data protection or how they use their personal data or how they control their information. But not many studies report the findings related to how they measure it. In this study is to evaluate the knowledge of the protection of personal information online. The central question is whether and to what extent user knowledge about it. Among the main knowledge about digital literacy, which is related to internet use (Park, 2015). Park (2015) suggested that the differences given implication on our socialization need to be addressed. In this study, we examine the level of knowledge regarding personal data protection among students based on gender. It was measure included the knowledge related to cookies (Degeling, 2019; Edward, 2019; King, 2010), privacy policies (Presthus & Sørum, 2018; Weinberger et al., 2017; Park, 2015), phishing and scam (Edward, 2019; Weinberger et al., 2017), media social (Romansky, 2014), private browsing (Saidi, et al., 2018; Tsalis, 2017) and Two-factor authentication (Vorakulpipat, et al., 2021; Weinberger et al., 2017).

Against such a backdrop, this study was carried out with the main aim of determining the levels of knowledge of the protection of personal data or information among student users by focusing on the gender factor. Specifically, this study was conducted to address the following two research questions:

    (a) What are the respondents' current levels of knowledge of security and protection of personal data?

    (b) Is there a significant difference in the knowledge of security and protection of personal data between male and female respondents?

Method

The research method used in this study was based on a quantitative approach involving a survey. The population of this study consists of students who study at a public university in the state of Perak. It has a variety of educational backgrounds. The survey sample consisted of 133 respondents aged between 17 and 24 years. According to the definition of the World Health Organization (WHO), a student is a person whose age lies between 10 and 24 years old (Kinghorn et al., 2018). As such, all the respondents of this survey were considered students. The research instrument used in this study consisted of two sections, namely Section A and Section B. The former helped gather information relating to the respondents' demographic profile, namely age and gender. On the other hand, the latter, which comprised 8 items, helped elicit information concerning their knowledge of privacy and personal data protection (Weinberger et al., 2017; Park's, 2011). In addition, respondents were asked to answer several multiple choice questions to determine their level of such knowledge.

Table 1. The Survey Questionnaire Items

Section	Item	Element
A	Demographic profile	Age and Sex
B	Knowledge of the privacy and personal data protection	a) Cookies
		b) Privacy policy
		c) Phishing and scam
		d) URL: http// vs https
		e) Social media- Facebook
		f) Net neutrality
		g) Private browsing
		h) Two-factor authentication

Data were analyzed using descriptive and inferential statistical procedures. Specifically, an independent samples t-test was used to determine whether the difference in the mean scores of knowledge of female and male respondents was significant or otherwise.

Results

The descriptive analysis performed showed the survey sample was made up of 62 male students and 71 female students, representing 46.6% and 53.4% of the total respondents, respectively. In terms of age, 74 or 56.6% of the

respondents were in the 21-24 age range, while 50 or 38.2% of those surveyed were in the 18–20 age range. The remaining 7 or 5.3% of the respondents were those whose ages were less than 18 years. Table 2 summarizes the percentages of the respondents based on gender and age.

Table 2. Demographic Profile of Survey Respondents

Gender	Male	62 (46.6%)
	Female	71 (53.4%)
Age	<18	7 (5.3%)
	18-20	50 (38.2%)
	21-24	74 (56.6%)

Table 3 shows the levels of respondents' knowledge of digital personal data protection based on the percentages of the correct answers to the eight aspects of such a factor.

Table 3. Respondents' Knowledge of Personal Data Protection

Security aspects	Respondents' responses		
	Correct	Incorrect	Not sure
Cookies	77(58.0%)	30 (22.6%)	26 (19.4%)
Privacy policy	66 (49.6%)	60 (45.1%)	5 (3.7%)
Secure websites with 'https://'	54 (40.6%)	45 (34.0%)	34 (25.4%)
Phishing scam	84 (63.2%)	43 (32.3%)	6 (4.5%)
Social media	122 (91.7%)	7 (5.3%)	4 (3.0%)
The term "net neutrality"	48 (36.1%)	32 (24.1%)	53 (39.8%)
Private browsing	43 (32.3%)	68 (51.1%)	22 (16.5%)
Two-factor authentication	48 (36.1%)	37 (27.8%)	48 (36.1%)

As shown in Table 3, 91.7% of the respondents were able to answer correctly the question relating to social media, indicating that their knowledge of this social media network was high. By contrast, their knowledge of privacy policy, 'net neutrality', private browsing, and two-factor authentication was low, given that less than 40% of the respondents were able to answer correctly to the questions relating to these three security aspects. Specifically, the percentages of those who provided the correct answers to these questions were 36.1%, 32.3%, and 36.1%, respectively. This finding, therefore, warrants remedial mitigation to help those with the lack of knowledge of these security aspects by exposing them to specific training or courses. Additionally, slightly more than half (58.0%) and a third (66.0%) of the respondents managed to answer correctly the questions to cookies and phishing scams, respectively, signifying that the levels of knowledge of most respondents regarding these security aspects were moderate.

However, the same was not replicated for privacy policy and secure websites (denoted by 'https://'), as the percentages of those who correctly answered the questions concerning these two security aspects were 49.6% and 40.6%, respectively, which were slightly below the mean percentage of 50%. Surely, more efforts are entailed to

help those who lacked such knowledge to ensure they would be more cautious and mindful when they are engaging in online activities. Collectively, the overall level of the knowledge of the student respondents concerning the security and protection of personal data and information was just slightly more than average, given that 50.9% of them were able to provide the correct answers to the relevant questions. As such, these findings merit serious attention by teaching practitioners the pressing need to educate such users regarding the importance of protecting their privacy and security when using social media on the internet.

Table 4 summarizes the descriptive analysis of the respondents' responses. As shown, the mean scores of the measurements of the knowledge of security and protection of personal data of male and female respondents were 4.05 (SD = 1.81) and 3.75 (SD = 1.63), respectively, apparently showing that the former outperformed the latter in this construct.

Table 4. Descriptive Analysis

Construct	Gender	N	Mean	Std. Deviation
Knowledge of the security and protection of personal data	Male	62	4.05	1.81
	Female	71	3.75	1.63
	Total	133		

An independent samples t-test was performed to determine whether there was a significant difference in the knowledge of security and protection of personal data between male and female respondents, the result of which is summarized in Table 5.

Table 5. Result of the Independent Sample t-test

Construct		t	df	Sig. (2 tailed)
Knowledge of the security and protection of personal data.	Equal variances assumed.	1.011	131	.314
	Equal variances not assumed.	1.004	123.64	.317

As indicated, there was no significant difference in the knowledge of security and protection of personal data between male and female respondents, t (131) = 1.01, p = .31. In other words, both genders attained statistically similar levels of knowledge of such a measure, which were moderately high.

Discussion

As highlighted in the literature, the landscape of social media is dominated by female student users compared to their opposite counterparts, indicating that most of the social network services are mainly developed to serve this particular group of internet users (Pewresearch, 2021). Given their dominance, it is expected that the former would exhibit higher levels of internet knowledge or skills than those of the latter. However, many studies have shown that this is not the case, as no particular gender has been observed to demonstrate higher levels of such knowledge

or skills consistently over the other. For example, there are some studies, including that of Lin and Wang (2020), have shown both genders fared equally well in internet knowledge or skills (Kaur et al., 2016; Dhir et al., 2016; Dhir et al., 2017).

However, it must be emphasized that there were instances where one particular gender outperformed the other one. For example, the finding of a study by Lin and Wang (2020) showed, in general, female users' understanding of the concept of personal data protection, such as privacy risk and safety characteristics, was significantly higher than that of male users. Albeit this finding, most studies have demonstrated consistent gender parity, with both male and female users performing at the same level in several tests of such security measures.

Such gender parity was demonstrated in this study in which both male and female student users performed moderately well in understanding the security and protection of personal data and information. Such a finding suggests that both genders need to be given the same type of training to help them further improve the level of knowledge of these security aspects when they are online. Specifically, they should be trained to understand the type of information that can be publicly shared, the types of websites that are safe to browse, two-factor authentication, the method of replying phishing emails, the technique of storing login information, and the avoidance of exposing or sharing of personal information in social media networks. Arguably, having learned all these security aspects, they will be made more conscious of the necessary precautions they have to take to minimize the risk of their personal data from being breached (Garba et al., 2020). They will also be made aware of the dire consequences of being too careless or casual when engaging in online activities, as their confidentiality and privacy can be severely compromised, resulting in reputational and financial losses.

Conclusion

In conclusion, the objectives of this study determined the levels of knowledge of the protection of personal data or information among student users by focusing on the gender factor. Inferential statistical analysis shows that there is no significant difference in the knowledge level of security and protection of personal data based on gender. Therefore, gender does not have any difference in the level of knowledge. Although there is no significant difference, the mean for the level of knowledge of male is high compared to female.

The results of this study provide information about the level of knowledge among students about privacy and personal data protection. Surfing the internet and using social media plays a big role in students' culture today. According to Jian and Kamsin (2021), 92% of students use the internet. They are used for sending messages, browsing through social networking sites and applications. Based on the percentage, it can be concluded that students are highly exposed to cybercrime as internet scams, identity fraud and so on are increasing because of the lack of awareness on security and protection of personal data. Therefore, these findings reinforce the need to improve users' knowledge of personal data protection through either the formal education using an appropriate curriculum or informal education using short courses. The impact of such education can help users to be more vigilant in sharing and exchanging data or information that is deemed confidential or personal that needs to be protected from being misused.

Recommendations

The recommendation is for future researchers-reviewers who want to conduct on personal data protection. This study only looks at students' perception of protection of personal data on cognitively. This study can be extended to testing skills in protection of personal data. We also suggest conducting a qualitative study for a future work, which would help to better understand the "story" behind these findings and could justify participants' behavior in regard to information security awareness issues.

Acknowledgements

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