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Understanding Digital Citizenship Indicators from Student Perspective in Malaysia

Razana Juhaida Johari[1]*, Yusarina Mat Isa[2], Nor Hafizah Abdul Rahman[3], Rina Fadhilah Ismail[4] and Norfadzilah Rashid[5]

[1,3]Faculty of Accountancy, Universiti Teknologi MARA Shah Alam, Selangor, Malaysia
[2,4]Faculty of Accountancy, Universiti Teknologi MARA, Kampus Puncak Alam, Selangor, Malaysia
[5]Faculty of Business and Management, Universiti Sultan Zainal Abidin, Terengganu, Malaysia

*Corresponding author: razana@uitm.edu.my (**ORCID ID:** 0000-0002-0042-6330)

ABSTRACT

The lifestyles of people have changed as a result of the recent rapid advancements in information and communication technologies. These technologies' digital tools and platforms have centred on the lives of individuals and have grown to be an integral component of people, especially young adults. The idea of digital citizenship is becoming more and more significant as people interact online. It is also recognized as a notion that aids educators and technology leaders in comprehending what students need to know in order to use technology responsibly. This study intends to determine student levels of digital citizenship and investigate factors affecting digital citizenship among Malaysian university students. A quantitative technique was used, with 205 undergraduate students from a Malaysian public university as the subjects. The findings demonstrate that the sample has a high degree of digital citizenship and that students' internet self-efficacy and attitudes toward the internet have a significant influence on their digital citizenship. The results of this study should be useful to educators and technology leaders in setting the right amount of assistance and direction to ensure that our future leaders can be active digital citizens. The study's shortcomings are emphasized, and some suggestions for fostering digital citizenship among university students are made.

HIGHLIGHTS

⊙ This paper is devoted to studying the factors influencing digital citizenship at one of the public universities in Malaysia. In the course of the study, the effect of students' internet self-efficacy and internet attitudes on digital citizenship are examined.

Keywords: Digital Citizenship, Internet Self-Efficacy, Internet Attitudes, Students, Malaysia

The lifestyles of persons have changed as a result of the recent rapid advancements in information and communication technologies (ICTs). These technologies' digital tools and platforms have become central to people's lives and an essential component of people, especially young adults. ICTs have a variety of benefits, but they also carry some concerns. People therefore require new skills to utilize modern technology to their fullest potential, minimize their risks, and participate in social life.

The Internet Users Survey by Malaysian Communications and Multimedia Commission (MCMC) in 2022 states that there were approximately 29.5 million internet users in Malaysia, an increase from around 29 million users in the previous year (data from the Statista Research Department published on Feb, 28, 2023). The number of

Malaysian internet users was forecast to grow early 32 million users by 2028. The idea of digital citizenship is becoming more and more significant as people connect digitally with content, one another, and numerous communities. It is also recognized as a concept that aids instructors and leaders in the field of technology in comprehending what students and other technology users need to know in order to use technology appropriately. It can be used as a teaching technique in classroom instruction to get students or technology users ready for a technologically advanced society.

Citizens are persons who have rights and obligations under the laws of a nation and have a nationality in the actual world. The idea of digital citizens is a result of changes in the rapidly changing digital environment. Digital citizenship is the capacity to utilize technology effectively, comprehend and analyze digital content, judge its reliability, use the right tools for creation, research, and communication, and think critically about the ethical opportunities and difficulties presented by the digital world. The use of the Internet and other rapidly evolving digital technologies have had a significant and dramatic impact on modern educational practice (Erdem & Kocyigit, 2019). For instance, Web-based learning, which involves integrating the Internet into classroom education, can help students learn through far-reaching, interactive, varied, individualised, and inquiry-oriented learning activities while also fostering their ability to construct knowledge and engage in meaningful learning.

Learners may have richer experiences using digital technology as it becomes more sophisticated and is widely employed for educational reasons. Although there are more and more chances for students to use technology to improve their learning outcomes, there aren't many research on digital citizenship (Choi, Glassman, & Cristol, 2017). Therefore, educational scholars, particularly in developing nations like Malaysia, should emphasise their knowledge on the level of students' digital citizenship and the contributing elements that may impact them, such as attitudes and self-efficacy towards the technology. The Malaysian government is making every effort to combat the harmful effects of the internet. The ability to succeed, obey, and behave responsibly online needs to be taught to

people who were born when digital technology first became accessible. Being an informed and involved citizen is important, but at the moment, academics and educators are at odds over how many factors could affect digital citizenship.

Without a doubt, having the right attitudes towards digital technology is necessary for successful digital citizenship. Previous research has shown that a new technology's acceptability and use are significantly influenced by the views people have towards it (Al-Zahrani, 2015). For instance, students' attitudes towards digital technology may affect how motivated and interested they are to learn how to utilize it, or the other way around. The internet self-efficacy, on the other hand, is another key aspect in deciding the effectiveness of applying a given task. Self-efficacy is defined as a learner's expectations and beliefs about his or her capacity to complete a task (Som & Kurt, 2018). While students may have more opportunity to study by utilizing the available technology, educators and researchers should start to focus on how effective they feel using digital technology.

The internet attitudes and computer self-efficacy of learners have been extensively studied by researchers over the past ten years (e.g., Colley & Comber, 2003; Tsai & Lin, 2004, Choi *et al.* 2017). Comparatively less studies have been done to look into these two aspects of digital technology, though. To investigate the effects of students' internet attitudes and internet self-efficacy on their digital citizenship, the current study is being undertaken. In light of education programs that seek to raise children with 21st century abilities, it is important to investigate associated aspects that affect digital citizenship in developing nations. The results of this study should help teachers and technology leaders provide the right level of assistance and direction to ensure that our future leaders are capable of being engaged digital citizens in the twenty-first century.

This paper is structured as follows: The next section presents the literature review and hypotheses development. This is followed by the deliberations on the research methodology, and a section that presents the results and discussions. Finally, the last section concludes this paper together with some limitations of the study and suggestion for future studies.

LITERATURE REVIEW AND HYPOTHESES DEVELOPMENT

Digital citizenship

The necessity to use technical tools and platforms to fill people's demands and rights has made the idea of "digital citizenship" more popular due to factors including the rapid growth of technology, its ability to cross national borders, globalization, and other factors. Scholars have different definitions and interpretations of the phrase "digital citizenship." The terms "cyber citizenship," "online and network citizenship," and "internet citizenship," in addition to "digital citizenship," are frequently used interchangeably; nevertheless, the meaning of "cyber citizenship" differs slightly depending on what the emphasis is placed (Bennett, Wells & Rank, 2009; Ribble, Bailey, & Ross, 2004).

According to previous research, digital citizens are those who use technology wisely and effectively (Isman & Gungoren, 2014; Ribble, 2011). Digital citizenship is also defined as the characteristics that enable citizens to use digital tools and behave appropriately in a variety of digital environments (Searson, Hancock, Soheil, & Shepherd, 2015). As opposed to this, Ahmad *et al.* (2021) claimed that the digital citizenship idea was established to increase young people's knowledge of online risks as a countermeasure to digital challenges. The idea is gaining popularity among academics and is congruent with the development and emphasis on digital citizenship, changes in the classroom environment into the use of digital devices, the internet, and digital textbooks, implications of smart education, and activation of online classes have become a global trend (Birgit, 2021). The information and digital world have already become and will continue to be a major stream for the coming civilization, regardless of how well students adapt to digital technology. Therefore, in order for people to participate as active citizens in the twenty-first century, they must become digital citizens.

Framework for digital citizenship scale

The following is a collection of the several conversations on the digital citizenship components that were crucial in developing the scale for digital citizenship. A few examples of the emotional, behavioral, and cognitive components of digital citizenship are human dignity, tolerance, community consciousness, responsibility, and care. Active engagement, self-regulatory behavior, and commitment to rules and laws are other influences. The most well-known researcher in the field, Ribble (2015) identified nine elements of digital citizenship: digital access, digital consumption, digital communication, digital literacy, digital etiquette, laws and regulations relating to digital use, digital rights and responsibilities, digital health, and digital security.

The aforementioned elements of digital citizenship have been used to create digital citizenship scales (Choi *et al.* 2017; Isman & Gungoren, 2014; Jones & Mitchell, 2016). In 2004, Ribble, Bailey, and Ross (2004) identified three elements for digital citizenship: respect (etiquette, access, and law), educate (communication, literacy, and commerce), and protect (rights and responsibility, safety/security, health and welfare). The new digital citizenship scale was created by Isman and Gungoren (2014) and Choi *et al.* (2017) using this assessment. In their most recent study on the subject, Choi et al. (2017) developed a digital citizenship score for adults after studying graduate students and college students. Internet political activism, technical skills, local/global awareness, critical perspective, and networking agency are the five factors that make up the study's digital citizenship scale.

Internet self-efficacy and digital citizenship

According to Bandura (1986), self-efficacy is the capacity of an individual to plan and carry out the steps necessary to reach the desired level of performance. To put it another way, self-efficacy is a type of self-evaluation that determines what behaviors to engage in, how much effort and perseverance is expended in the face of challenges, and ultimately, whether or not the behavior is mastered (Bandura, 1997). Internet self-efficacy is described by Eastin and LaRose (2000) as the conviction that one can successfully carry out various one-stop behaviors, such as utilizing the internet, while maintaining consistency aside from abilities of main individual computer usage.

The perceived behavioral control notion, which gauges an individual's perception of the ease or difficulty of carrying out an activity, is derived

from self-efficacy in the Theory of Planned Behavior (Azjen, 1985). Hatlevik, Throndsen, Loi, and Gudmundsdottir (2018) emphasized how the concept of self-efficacy has grown significantly by becoming associated with computers. Previous studies on Internet self-efficacy have only focused on restricted behavioral areas and task performance rather than overall accomplishments in connection to general Internet use (Eastin & LaRose, 2000). There are numerous studies in the literature that scale an individual's perceived self-efficacy based on the usage of informatics technologies including computers, the internet, and technology. It demonstrates that the most significant variable of Internet self-efficacy is expertise in using the Internet.

Internet self-efficacy includes the judgmental capacity to apply skills to more complex activities as well as simple sub-component skills like disc formatting or spreadsheet formulas. People with lower levels of Internet self-efficacy won't have as strong of a technological aptitude, and as a result, they won't be able to perceive how well they are executing their jobs at work. Because it will motivate them to take part in continuous improvement, it is crucial to have enough or great self-efficacy (Elstad & Christophersen, 2017).

In empirical research e.g., Choi, Cristol & Gimbert (2018), Kim & Choi (2018), internet self-efficacy was utilized to examine self-efficacy in relation to digital citizenship behavior. Internet self-efficacy in digital citizenship is the capacity to use technology to participate in a range of online activities (Choi *et al.* 2017). Good digital citizens are seen as confident in their technology know-how and use it to respect both themselves and others. However, there is conflicting research evidence about the relationship between self-efficacy and the practice of digital citizenship. The focus on social media self-efficacy by Choi *et al.* (2017), Kim & Choi (2018), and Xu *et al.* (2018) demonstrated that it is a predictor of digital citizenship, with a favorable correlation found with the internet self-efficacy construct. On the other side, Al Zahrani (2015) found no correlation, especially when it came to the issue of digital citizenship and defending oneself or others. Self-efficacy suggested that this made it relevant for use in conceptualizing digital citizenship in the future.

Based on the above arguments, the following hypotheses is developed:

H_1: *There is a significant relationship between internet self-efficacy and student's digital citizenship.*

Internet attitudes and digital citizenship

Tsai, Lin and Tsai (2001) claimed that attitudes towards or perceptions of using the internet have a significant effect in actual usage. As such, internet attitudes should be viewed as a component of internet literacy. According to Azjen (1985), attitudes in the Theory of Planned Behavior explain intention, which in turn explains behavior. People's attitudes towards particular behaviors are influenced by their ideas about those behaviors, according to the model's explanation. According to Ajzen and Fishbein (1975), belief is the subjective likelihood that a particular event will result from a behavior. As a result, attitudes towards the internet are thought to play a significant role in how well technology is accepted and used (Porter & Donthu, 2006; Teo, Lee, & Chai, 2008), and these views are directly linked to internet use.

Notably, Jackson *et al.* (2003) found that adults' internet use was better predicted by negative online attitudes than by favorable ones. When adults believe that online information is incomplete and the internet is less significant, they use it more for social interaction. According to Peng, Tsai and Wu (2006), learners' online attitudes may have an impact on their interest in and readiness to learn in web-based learning settings. People generally have highly good sentiments towards the internet, and this is especially true if they use it more frequently, according to research from the past (Jackson et al., 2003). One study that focused on college students came to the conclusion that regular Internet use for both personal and academic objectives is related to college students' positive sentiments about the platform (Duggan, Hess, Morgan, Kim & Wilson, 2001).

Another study found a similar relationship between college students' opinions towards the Internet and their Internet use, including its intensity, frequency, and diversity (Cheung & Huang, 2005). In accordance with Peng *et al.* (2006), college students who viewed the internet as a "tour" or "toy" demonstrated a more favorable attitude

towards the medium and had higher levels of communicative self-efficacy than those who saw it as a "technology" or "tool". Hatlevik et al., (2018) mentioned that students' perspectives on the internet may influence their drive and enthusiasm for using it, or vice versa. According to earlier research (Houle, 1996), students' attitudes towards computers may affect how well they use and learn computers, so it stands to reason that their attitudes towards the internet may also affect how well they use internet technology.

Based on the above discussions, the following hypotheses is developed:

H₂: There is a significant relationship between internet attitudes and student's digital citizenship.

RESEARCH METHODOLOGY

Data Collection

This study distributed 313 online questionnaire surveys to the accountancy students in the largest public universities in Selangor. According to information from the Academic Affairs Department, there are 1,733 total students on campus. The sample size for this study was chosen based on the sample size selection proposal by Krejcie and Morgan (1970), which recommended a sample size of 313 for a population of 1,700. Prior to the final data collection, the questionnaire underwent a pilot test to make sure it was well-structured, manageably brief, and simple to complete.

Data Analysis

The present research employed the partial least-squares structural equation model (PLS-SEM) using the SmartPLS 4.0 software to perform the statistical analysis. PLS-SEM is an SEM approach for estimating a theoretically established cause–effect model using the variance-based partial least-squares technique. The model technique is based on an iterative approach, which operates like a multiple regression analysis (Hair *et al.* 2011).

Measurements of the Variable

Responses to survey questions were evaluated by using a seven-point Likert scale of 1 to 7, "Strongly Disagree, Disagree, Slightly Disagree, Neutral, Slightly Agree, Agree, Strongly Agree",

respectively. These Likert scales were selected because they are the most dependable instruments for measuring levels of attitudes, perceptions, and behaviors (El Refae *et al.* 2021). This study adapted the measurement items from the literature and customized them to suit the current settings. The dependent variable i.e., digital citizenship was measured by a questionnaire referring to the study of Al-Zahrani (2015) and Ribble (2014). Whereas, the independent variables i.e., internet attitude and internet self-efficacy were adapted from Sam, Othman and Nordin (2005) and Al-Zahrani (2015), respectively.

RESULTS AND DISCUSSION

Descriptive Statistics of the Respondents

A total of 205 or 65.5% of response rate were received in the SurveyMonkey database from the 313 questionnaires links sent via e-mail, WhatsApp, and Telegram. Luo (2020) noted in his study that the average of the student's response rate on quantitative evaluation generally falling between 30% and 60% (Anderson, Brown, & Spaeth, 2006; Nulty, 2008). Descriptive analysis was performed on the demographic profile of the respondents. The results of the descriptive analysis showed that 56% of the respondents are from the age of above 22 years old with a frequency of 114 students. In term of respondents' gender, the result showed that most of the respondents are female students with a frequency of 148 students i.e., 72%. This is because majority of the students in Malaysian universities are female. All of the respondents are Malay since the selected institution mainly catered for the Malays and Bumiputra students.

In term of the family's average income per month, most of the respondents (53%) stated that their parents earned below RM5,000 per month with a frequency of 107 students. As for the year of study, most of the respondents are in third year with a frequency of 73 students, followed by first year, second final year and final year accounting students. In terms of computer hours spent a day, majority of the respondents (32%) spent more than 5 hours per day in front of their computer and 81% of them also spent more than 5 hours per day on their handphone. It seemed that majority of respondents are using the internet either by using their computer or handphone.

Data Analysis

This study used partial least squares (PLS) modelling using the SmartPLS 4.0.9 version (Ringle *et al.* 2015) as the statistical tool to examine the measurement and structural model as it does not require normality assumption and survey research is normally not normally distributed (Chin *et al.* 2003). The suggestions by Anderson and Gerbing (1988) were followed to test the model developed using a 2-step approach. First, the measurement model is used to test the validity and reliability of the instruments used following the guidelines of Hair *et al.* (2019) then the structural model was run to test the hypothesis developed.

Measurement Model

For the measurement model, the analysis conducted assessed the loadings, average variance extracted (AVE) and the composite reliability (CR). The values of loadings should be ≥0.5, the AVE should be ≥ 0.5 and the CR should be ≥ 0.7. As shown in Table 1, the AVEs are all higher than 0.5 and the CRs are all higher than 0.7. The loadings were also acceptable with few loadings less than 0.708 which is acceptable (Hair *et al.* 2019). It is concluded that the constructs meet reliability and convergent validity requirement. Figure 1 depicted the diagram of the measurement model of this study.

Table 1: Convergent Validity

Variable	Items	Loading	CR	AVE
Computer Self-Efficacy	CSE03	0.570	0.921	0.518
	CSE04	0.740		
	CSE05	0.739		
	CSE06	0.771		
	CSE07	0.780		
	CSE12	0.760		
	CSE15	0.627		
	CSE16	0.727		
	CSE17	0.821		
	CSE18	0.644		
	CSE19	0.702		
Digital Citizenship	DC_EDU	0.906	0.906	0.762
	DC_PROTECT	0.837		
	DC_RESPECT	0.876		

Variable	Items	Loading	CR	AVE
Internet Attitudes	IA03	0.646	0.861	0.508
	IA04	0.724		
	IA05	0.687		
	IA06	0.753		
	IA07	0.731		
	IA08	0.730		

Note: CSE01, CSE02, CSE08, CSE09, CSE10, CSE11, CSE13, CSE14 for Computer Self-efficacy and IA01, IA02 for Internet Attitudes was deleted due to low loading.
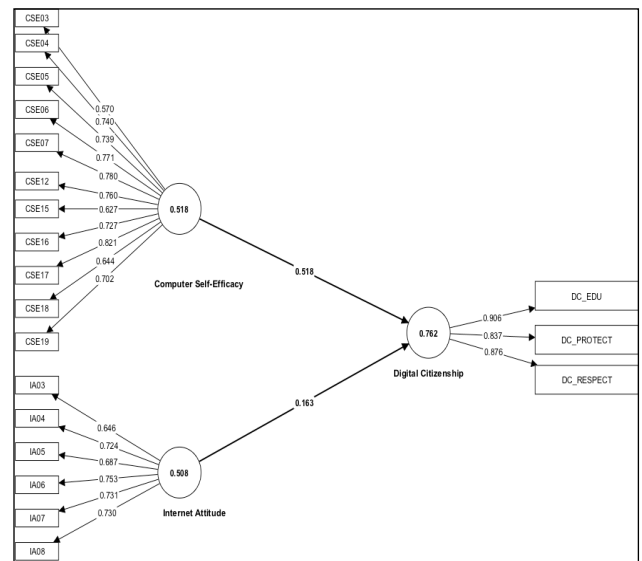

Fig. 1: Measurement Model

Then in step 2, the discriminant validity was assessed using the HTMT criterion suggested by Henseler *et al.* (2015). The HTMT values should be ≤ 0.85 the stricter criterion and the mode lenient criterion is it should be ≤ 0.90. As shown in Table 2, the values of HTMT were all lower than the stricter criterion of ≤ 0.85 as such it is concluded that the respondents understood that the 3 constructs are distinct. Taken together both these validity test has shown that the measurement items are both valid and reliable.

Table 2: Discriminant Validity (HTMT)

	1	2	3
1. Computer Self-Efficacy			
2. Digital Citizenship	0.684		
3. Internet Attitudes	0.653	0.539	

Table 3: Hypothesis Testing

Hypothesis	Relation-ship	Std Beta	Std Dev	t-value	p-value	VIF	R²
H₁	Internet Self-Efficacy -> Digital Citizenship	0.518	0.076	6.810	0.000	1.463	
H₂	Internet Attitudes -> Digital Citizenship	0.163	0.092	1.775	0.038	1.463	39.1%

Structural Model

As suggested by Hair *et al.* (2019) the analysis reported the path coefficients, the standard errors, t-values and p-values for the structural model using a 5,000-sample re-sample bootstrapping procedure.
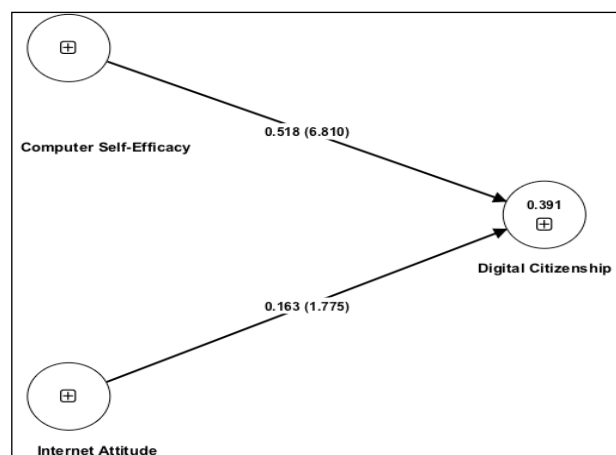

Fig. 2: Structural Model

Table 3 shows the summary of the criterions that have been used to test the developed hypotheses. The effect of the 2 predictors on Digital Citizenship were tested and the results revealed the value of R^2 was 0.391 which shows that all the 2 predictors explained 39.1% of the variance in Digital Citizenship.

As the data in Table 3 suggest, the internet self-efficacy ($\beta = 0.518$, $p < 0.01$) is positively significant related to students' digital citizenship, thus H1 is supported. It is suggested that students who have a greater degree of internet self-efficacy have better levels of digital citizenship, which supports the findings of earlier studies by Ke & Xu (2017), Al-Zahrani (2015), and Cigdem (2015). Indirectly, this study demonstrated that future leaders who have a high level of internet self-efficacy are more likely to view the internet as a valuable technology tool.

Additionally, the students' internet attitudes ($\beta = 0.163$, $p < 0.05$) also have positive significant relationship to digital citizenship, thus H2 is also supported. This result reinforced the findings of earlier studies by Hatlevik *et al.* (2018), Ke and Xu (2017), Al-Zahrani (2015), and Wu and Tsai (2006) by demonstrating that attitudes about the internet have a direct impact on digital citizenship. Students who have more positive attitudes towards the internet are more likely to grow up to be responsible online users. In other words, students' attitudes towards technology may influence their future willingness to use the internet and encourage improved digital citizenship.

CONCLUSION

In one of Malaysia's public universities, this study examined at how students' attitudes and internet self-efficacy affected their understanding of digital citizenship. The results showed that although the students' attitudes towards the internet are moderate, they do have roughly greater levels of digital citizenship and assumed self-efficacy. In addition, students' digital citizenship in terms of respecting themselves and others, educating themselves and connecting with others, as well as safeguarding themselves and others, are significantly impacted by both internet attitudes and internet self-efficacy.

The government may be able to adopt appropriate policies for digital practices in the higher education sector as a result of the findings, in a practical sense. In addition to going beyond just outlining what, when, and how to utilize technology efficiently, regulations should have a primary goal that could foster the ideals of good digital citizenship. To prepare students at all levels for the technological problems of the future, all teaching and learning institutions should release awareness campaigns or workshops on a regular basis. This study does, however, have certain drawbacks. For example, the small research sample size indicates that it cannot accurately reflect all student populations at Malaysian universities. The study also only looked at two primary components and made no mention of any connected factors. Therefore, future research

should consider these ideas, expand on this study, and get beyond its limits.

ACKNOWLEDGEMENTS

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