



Research Journal of Social Sciences

ISSN: 1815-9125 EISSN: 2309-9631

JOURNAL home page: <http://www.aensiweb.com/RJSS>

2015 Special; 8(11): pages 20-24.

Published Online 31 October 2015.

Research Article

Self-Regulated Digital Citizen: A Survey of Malaysian Undergraduates

Mohamad Sahari Nordin

Kulliyah of Education, International Islamic University Malaysia, Malaysia

Received: 23 September 2015; Accepted: 25 October 2015

Copyright © 2015 by authors and American-Eurasian Network for Scientific Information.

This work is licensed under the Creative Commons Attribution International License (CC BY).

<http://creativecommons.org/licenses/by/4.0/>



ABSTRACT

The purpose of the study was to examine the degree to which students' self-regulated behaviors influence their ethical behaviors and self-protecting use of digital technology. Data were collected from 250 undergraduates who were studying at 10 higher learning institutions in Malaysia, using a 9-item digital citizenship questionnaire. To address the research objectives, the data were subjected to confirmatory factor analysis and structural equation modeling. The results of data analysis supported the research hypotheses, in which students' digital citizenship is a valid and reliable multidimensional construct, and students' self-regulated behavior influences their ethical and self-protecting digital behaviors. The findings suggest for further research and instructional interventions, in particular in the curriculum implementation, which need to be aligned to students' development of self-regulatory capabilities.

Key words: Digital Citizenship, Self-Regulated behavior, Ethical Online Behavior, Self-Protecting Digital Behavior, Structural Equation Modeling

INTRODUCTION

The unstoppable surge of digital technology into students' life over the world promises new frontiers of benefits and opportunities. Digital technology enables them to virtually learn and interact more meaningfully [22], in addition of indirect and unexpected educational, psychological, social, and economic returns. These students are the digital citizens who practice conscientious use of technology, demonstrate responsible use of information, and maintain a good attitude for learning with technology [8,16].

However, young people are prone to get mixed up in technology misuse. Incidences of cyber bullying, sexting, Internet plagiarism, identity and

information theft, hacking, illegal downloading of movie and music files, using mobile phones during class/lectures, using email or Facebook to intimidate or scorn others, and many other ill-natured uses of technology are routinely registered across the globe. These harmful phenomena have been reported at a disturbing frequency [12]. It is for this reason that stirs a growing interest in promoting safe and ethical digital citizenship among students.

Much research has been conducted particularly on misuse of digital technology. Unethical and illegitimate use of technology has been observed to be systematically associated with students' denial of responsibility, denial of injury, denial of victim, condemnation of the condemners, and appeal to higher loyalties [5,21], self-control [11]. Recently

Corresponding Author: Mohamad Sahari Nordin, Department of Education Psychology and Counseling, Kulliyah of Education, International Islamic University Malaysia, Malaysia.

Tel: +60-0193378616, Fax: +60-61964851; E-mail: msahari@iium.edu.my

Phau and Liang [13] found that students' attitudes, affects, moral judgment, and self-efficacy significantly and substantially explained the variability of students' intention to download pirated games.

On the other hand, little is known about student variables that determine safe and ethical digital citizenship. Obviously it is equally useful to profile what makes a good digital citizen. One of the most promising determinants is students' self-regulated capabilities [2]. Self-regulated behaviors, being of a changeable nature, are "at the very heart of causal processes. They not only mediate the effects of most external influences, but provide the very basis for purposeful action" [2]. Self-regulation is a desirable attribute because it enhances positive behavior and the learning.

Objectives:

To address the gap in the literature, the present study aimed to examine digital citizenship behaviors among undergraduate students. First, the aim of the study was to validate whether the students' responses to the questionnaire items constituted meaningful dimensions of digital citizenship. Next, the study aimed to examine whether students' self-regulated behaviors influences their ethical use of digital technology. Finally, the study aimed to verify the influence of self-regulated behaviors on students' safe use of the technology.

In doing so, the study attempted to validate empirically a digital citizenship model. Specifically, it tested the adequacy of undergraduate students' self-regulated behaviors in explaining safe and ethical digital citizenship.

The study applied the digital citizenship framework developed by Ribble and Bailey [15]. It focused on two of the nine digital citizenship dimensions of the framework, namely the self-protecting and ethical interaction dimensions [16,18,14,7]. These two digital citizenship components are primarily within the realm of individual students' behaviors. Earlier, Sincar [19] suggests that the other components also involve higher levels of accountability for technology, which are the policy makers, community leaders, technology leaders, and teachers.

Safe self-protecting users of digital technology exercise electronic precautions to safe-guard their wellbeing. Such users would more likely to install and update antivirus software, install and update antispy software, and turnon firewall. These actions are important in protecting electronic data, in particular those sensitive data which may cost other people's safety and comfort. Ethical online interactions are the practice to observe customary rules, norms and expectations, most of which are unwritten [6,10]. For example, digital citizens state their reasons when they disagree on something, do

not engage in online fights, and obey digital rules and regulations.

Self-regulation refers to one's "self-reflective and self-reactive capabilities that enable [him/her] to exercise some control over [his/her] thoughts, feelings, motivation, and action . . . an interplay of self-generated and external sources of influence" [2]. One's self-regulation system is loaded with moral values and moral standards that enable one to decide between the right and the wrong actions. In the context of digital citizenship behaviors, self-regulated students are the law-abiding users of communication technology who take responsibility of their online actions and deeds [4,6]. They are aware of the legal consequences of violating related rules and laws. They are likely to agree that, "network administrator has the authority to monitor computer and internet usage," "use the computer within the timeline given by the instructor," and "avoid copyright infringement."

In all likelihood a self-regulated student has higher levels of tendency to behave ethically [20]. Such a student would be more thoughtful, concerned, and motivated to observe online rules and regulation; they readily abide the societal norms and expectation. They would consider obeying mobile phone bans, avoiding online fights, and explaining reasons for disagreement as the right things to do. On a similar note, a self-regulated digital technology user would take electronic precautions to safe-guard their wellbeing. Thus, the study hypothesized that:

H₁ A two-dimension digital citizenship construct is valid and reliable

H₂ Students' self-regulated behavior positively determines their safe use of digital technology

H₃ Students' self-regulated behavior positively influences their practice of ethical digital citizenship

Method:

The data were drawn from 250 undergraduates studying at 10 institutions of higher education in Malaysia. They volunteered to participate in the study. The gender composition of the sample was typical of the undergraduate student population in Malaysia, 74% was female students. The majority (79%) of the sample was university students, while the remaining respondents comprised polytechnic undergraduates. The sample size was adequate to address the research objectives [3,9] which included the use of correlational causal modeling.

The study used a 9-item questionnaire that basically measures university students' digital citizenship behaviors. The items were extracted from the work of Mike Ribble and his colleagues [15,18,16,14]. The items represent the expectation that they are indicators of the two sub-constructs of digital citizenship, namely ethical (3 items) and self-protecting (3 items). Also the questionnaire contains three items to measure students' self-regulated digital

behaviors. Students self-rated their digital behaviors on 5 response categories, i.e. "Never," "Once in a While," "Sometimes," "Frequently" and "All the Time."

To test the research hypotheses, the study applied structural equation modeling (SEM) using the AMOS (version 20) model-fitting program. The structural model comprises three latent variables, with two endogenous variables (self-protecting and ethical behavior) and one exogenous variable, that is the students' self-regulated digital behavior. Each latent variable was represented by three observed variables, which were the questionnaire items.

Adopting the confirmatory modeling strategy, the causal relationships were tested on the basis of the covariance matrix derived from the data. Maximum likelihood procedure was used to estimate the parameters. The preliminary analysis indicated that the assumption of univariate normality was tenable, with skewness and kurtosis distributed with the values of $|1| [3,9]$. The good-fit of the model was examined using the conventional standards for an adequate model, which are the, (i) consistency of the causal model with the data, (ii) reasonableness of the parameter estimates, and (iii) the proportion of variance of the endogenous variables explained by the students' self-regulated digital behavior. The analysis adopted several fit indexes, namely the relative chi-square (χ^2/df), CFI (comparative fit

index), and RMSEA (root mean square error of approximation). Arbuckle and Wothke (1995) suggest that the CMIN/df with a value of between 2 and 5 is considered acceptable. Additionally, CFI values range from zero to 1, with values close to one demonstrating a good fit. Finally, a value of RMSEA of .08 or less shows a reasonable error of estimation.

Results:

This section presents the results of the structural equation modeling that addressed the objective of the study. First, it reports the adequacy of a two-factor solution that was used to measure students' digital citizen through the use of confirmatory factor analysis (CFA). Next, the results of the full-fledged SEM that tested the research hypotheses are presented.

4.1. Adequacy of the Measure of Digital Citizenship:

Table 1 shows the descriptive statistics of the items included in the confirmatory analysis. The maximum possible score for each item is 4, the mean score of all items distributed above hypothetical mean of 2.0. The value of each Cronbach's alpha, which indicates the internal consistency index of the students' responses to the related items were reasonable. The minimum value of the reliability index was .77, and it satisfied the cutscore of .70 deemed critical for a reliable measure.

Table 1: Item Statistics

Code	Dimension/Sub-Construct	Mean	SD	Alpha
	Etiquette			.77
etq1	I state my reasons when I disagree on something.	2.76	.87	
etq2	I don't encourage online fight even if I encounter one.	2.74	1.0	
etq3	I obey mobile phone bans.	2.57	.99	
	Safe/Self-Protecting			.78
sc1	I update browser.	2.67	1.0	
sc2	I install and update antivirus software.	2.99	1.0	
sc3	I install and update antispay software.	2.73	1.2	
	Self-Regulated			.85
r1	I agree that network administrator has the authority to monitor computer and internet usage.	2.88	.90	
r2	I use the computer within the timeline given by the instructor.	2.84	.87	
r3	I avoid copyright infringement.	2.79	.93	

As expected, the results of CFA provided evidence supporting for the validity of a two-factor digital citizenship. The measurement model fitted the variance-covariance matrix; $\chi^2/df = 1.28$; CFI = .996; RMSEA = .034. The population RMSEA for the digital citizen model distributed between .00 and .086, with 90% confidence.

All parameter estimates were substantial and statistically significant. The direction and magnitude of the factor loadings, which ranged between .70 and .89 were behaving as expected. The two latent variables, ethical behavior and self-protecting behavior were moderately correlated, $r = .54$. These are the indications of convergent validity and discriminant validity of the instrument. Hence, the results suggested that the hypothesized measure of

digital citizenship was consistent with the data. In sum, it is reasonable to use the two-dimension instrument to reliably measure students' use of digital technology.

4.2. Adequacy of the Digital Citizenship Causal Model:

Figure 1 contains the results of SEM of the digital citizenship model. The confirmatory modeling yielded consistency of the hypothesized causal relationships with the data (normed chi-square = 2.06; RMSEA = .065; CFI = .97). These fit indices satisfied the critical cutscores of an adequate model.

The parameter estimates of the hypothesized model were free from inconsistencies. The standardized paths indicated that the self-regulated

digital behavior positively affects students' self-protecting and ethical behaviors. Somewhat similar standardized effect sizes, $\beta = .68$ were observed for each relationship, i.e. self-regulated \rightarrow ethical behavior and self-regulated \rightarrow self-protecting behavior.

The path coefficients of the casual structure were statistically significant at .005 levels, and were of practical importance. In addition, the analysis revealed that self-regulated behavior substantially explained about 46% of the variability of each of the students' self-reported digital citizenship behaviors.

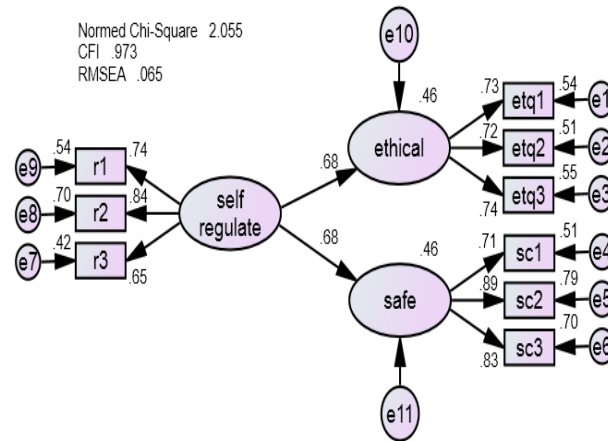


Fig. 1: Results of the Hypothesized Digital Citizenship Model

In recap, the results of data analysis offer evidence to support the expectations that students' self-regulated behavior influences their (1) ethical, and (2) self-protecting digital behaviors.

Discussion And Conclusion:

The aim of the study was to establish the adequacy of a digital citizenship model. It tested the influence of students' self-regulated digital behaviors on their ethical and self-protecting online behaviors. The evidence is consistent and extends current understanding of the nature of university students' digital citizenship in several ways. First, the results are in keeping with the notion that digital citizenship is a valid and reliable multidimensional construct [15,18,14,7]. The results corroborated the prevalence of two of Ribble's nine elements of digital citizenship. These two elements are primarily within individual students' areas of accountability, which could be enhanced via instructional interventions.

It also appeared that the brief instrument, which comprises indicators of ethical and self-protecting behaviors, is valid and reliable. The instrument with the two distinct but related dimensions of the digital citizenship is psychometrically sound in terms of the internal consistency of the responses, convergent validity, and discriminant validity. Based on the results, the 2-dimension instrument used in the study is therefore practically useful in diagnostic and evaluative assessments of students' practices of digital citizenship.

Second, the study found empirical support that higher levels of self-regulations are positively and systematically associated with ethical and self-protecting behaviors. As expected, students' self-regulated behaviors influenced their ethical and self-

protecting online behaviors. The strength of each relationship was profound, approaching 50% of the variance explained. Evidently, this finding concurs with the postulation that self-regulation is an essential precondition to digital citizenship.

Since digital citizenship has been found to be a multidimensional construct, researchers should not make the mistake of using and interpreting composite scores to assign students to levels of digital citizenship. Instead, the results suggest the use of at least two separate scores—ethical behaviors and self-protecting behaviors—as indicators. This is because a student with a high score on self-protecting behaviors may not perform as well on the ethical dimension. This means that each dimension of digital citizenship should be examined individually and interpreted within the limits of its own definition. Otherwise, some important causal links may be overlooked.

Limited within the research framework, the results of the study have produced additional paths for research on digital citizenship. First, it is imperative to expand and refine the conception of ethical and safe digital behaviors in order to be more comprehensively representative of digital citizenship among the digital natives and digital immigrants. Second, empirical cross-validation of the causal model of digital citizenship is called for to determine the extent of its usefulness in different contexts and culture. Finally, it is also important that studies be conducted to identify other determinants of digital citizenship, using robust design that includes longitudinal and experimental designs.

Finally, self-regulated online behavior was found to be a strong determinant of digital citizenship. If this observation is defensible, then the finding merits special attention [20]. It points to a

need to revisit the curriculum implementation and instructional intervention of digital citizenship, and in general character education. As indicated by Bandura [1] the curriculum should enable development of morality, which forms the basis of students' self-regulatory capabilities. To be effectively self-regulate, students need to be able to understand, evaluate, justify, and set standards of right and wrong digital behaviors, which would serve as their codes of conduct. Consequently, their social-cognitive processes would trigger them to monitor their behavior, and evaluate it in light of their moral standards. Eventually they would be able to consistently act in ethical and safe manners, the results of which would be self-regard and satisfaction.

ACKNOWLEDGMENTS

The study was conducted with the funding and managerial assistance from the Prestariang Systems Sdn Berhad, Malaysia. The research team would like to thank the management team of corporation for its trust and continuous support.

REFERENCES

- Bandura A., 1986. *Social foundations of thought and action: A social cognitive theory.*, Englewoods Cliff, NJ: Prentice-Hall.
- Bandura A., 1991. Social cognitive theory of self-regulation. *Organizational Behavior and Human Decision Processes*, 50: 248-287.
- Byrne, B.M., 2010. *Structural equation model with AMOS: Basic concepts, applications, and programming* (2nd Edition)., Mahwah, N.J: Lawrence Erlbaum Associates, Inc.
- Curran MBFX., 2012. *iCitizen: Are you a socially responsible digital citizen?* Paper presented at the International Society for Technology in Education. 2012, June, retrieved June 3, 2015 at www.isteconference.org/2012/.../iCitizenResearchPaperISTE2012_RP.pdf
- Hinduja, S., 2006. Neutralization theory and online software piracy: an empirical analysis. *Ethics and Information Technology*, 9(3): 187-204.
- Hollandsworth, R., L. Dowdy and J. Donovan, 2011. Digital Citizenship in K-12: It Takes a Village. *TechTrends: Linking Research & Practice to Improve Learning*, 55(4): 37-47.
- Isman, A and O. Canan Gungoren, 2014. Digital Citizenship. *Turkish Online Journal of Educational Technology-TOJET*. 13(1): 73-77.
- ISTE., 2007. National Educational Technology Standards and Performance Indicators for Students., retrieved March 10, 2014 from http://www.iste.org/Content/NavigationMenu/NETS/ForStudents/2007Standards/NETS_for_Students_Standards.pdf.
- Kline, R.B., 2011. *Principles and practice of structural equation modeling* (3rd edition). New York: Guilford.
- Lenhart, A and M. Madden Teens, 2007. privacy, & online social networks. Pew Internet and American Life Project Report.
- Morris, R.G. and G.E. Higgins, 2009. Neutralizing potential and self-reported digital piracy: a multitheoretical exploration among college undergraduates. *Criminal Justice Review*, 34(2): 173-95.
- Nuccetelli, S., 2013. *50 online child predator prevention tips.*, retrieved June 14, 2015 at <https://darkpsychology-educationviewsor.netdna-ssl.com/wp-content/uploads//2013/02/50-online-predator-prevention-tips-ipredator-inc.pdf>
- Phau, I and J. Liang, 2012. Downloading digital game: predictors, moderators and consequences. *Marketing Intelligence & Planning.*, 30(7): 740-756.
- Ribble, M.S., 2011. *Digital citizenship in school: Nine elements all students should know* (2nd edition), Eugene, OR: ISTE.
- Ribble, M.S and G. Bailey, 2004. Digital citizenship: Focus questions for implementation. *Learning and Leading with Technology.*, 32(2): 12-15.
- Ribble, M.S., G.D. Bailey and T.W. Ross, 2004. Digital citizenship: Addressing appropriate technology behavior. *Learning & Leading with Technology*, 32(1): 7-11.
- Ribble, M.S and G.D. Bailey, 2005. Developing ethical direction. *Learning & Leading with Technology*, 32(7): 36-38.
- Ribble, M.S and G.D. Bailey, 2007. *Digital citizenship in schools.*, Washington, DC: International Society for Technology in Education (ISTE).
- Sincar, M., 2013. Examination of the inappropriate behaviors displayed by prospective teachers through digital devices in terms of certain variables. *Çukurova University Faculty of Education Journal*, 42(1): 1-12.
- Shu, L.L., F. Gino and M.H. Bazerman, 2011. Dishonest deeds, clear conscience: When cheating lead to moral disengagement and motivated forgetting. *Personality and Social Psychology Bulletin*, 37(3): 330-349.
- Sykes, G and D. Matza, 1957. Techniques of neutralization: a theory of delinquency. *American Sociological Review*, 22(6): 664-70.
- Westheimer, J. and J. Kahne, 2004. What kind of citizen? The politics of educating for democracy. *American Educational Research Journal*, 41(2): 237-269.