

Developing a Teaching and Learning Model to Foster Digital Citizenship in General Education Undergraduate Courses

Supit Boonlab¹ & Pattama Pasitpakakul^{2*}

Abstract

Digital society presents a significant challenge to human life skills, particularly for Generation Z, which is pursuing higher education and work. Thus, undergraduate programs should enhance curricula and teaching-learning models to foster digital citizenship, supporting students in an ever-evolving digital world. The purpose of this research is to explore university students' digital learning skills and analyze 21st-century digital citizenship models. The study used a quantitative methodology, which included a questionnaire survey administered to 434 individuals, encompassing both current state university students and alumni. A structural equation modeling (SEM) was employed to analyze the study data. The study findings reveal that digital expression behavior consisted of two characteristics: identity and outstanding and appropriate participation. The digital citizen feature comprised three characteristics: digital manners, creative use, and digital intelligence. Overall, digital excellence traits were at a high-level average in digital transactions (e.g., money transfers, online product buying and selling, subscription, contract agreements, etc.). An effective 21st-century digital citizenship model comprises three key factors: outstanding and appropriate participation, digital etiquette, and creative utilization, all of which positively impact digital excellence.

Keywords: Digital citizenship, general education course, teaching and learning, undergraduate

Introduction

University serves as the platform for preparing graduates for labor market. In Thailand, every college offers a general education curriculum that undergraduate must study alongside their compulsory hard-skill courses. In the 21st-century era, digital skills are crucial for improving one's quality of life, not only for individuals of any social class but also for their access to workplaces and the broader society they inhabit. Furthermore, if colleges aim to produce proficient students equipped with both competencies and the so-called "soft skills" required for future careers, they must offer suitable courses to facilitate student learning along their academic journey. Moreover, a graduate who aims to contribute to society and their nation possesses not only professional but

¹ Assist. Prof. Dr., Rajamangala University of Technology, Thailand, e-mail: supit_b@rmutt.ac.th

^{2*} Corresponding author, Assist. Prof. Dr., Rajamangala University of Technology, Thailand, e-mail: pattama@rmutt.ac.th

also social competence, ready to shoulder responsibilities amidst digital transformation. This underscores the importance of understanding how digital citizenship can benefit organizations, society, nations, and the world as a whole.

Digital citizenship is crucial in the context of ethnicity, age, language, and cultural diversity. Digital citizens should embody responsibility, ethics, compassion, and respect in their participation, with a focus on social justice. The concept of citizenship has expanded significantly due to living in a global and online society. Therefore, citizenship extends beyond mere participation in elections or involvement in national government; it encompasses the ability to comprehend local, national, and global phenomena simultaneously, as well as how to conduct oneself responsibly, ethically, and safely in the online realm (Isman & Gungoren, 2014; Ribble et al. 2004).

The Internet encompasses a variety of communication technologies, including websites, email, social media, blogs, video streaming, instant messaging systems, voice over internet protocol, online forums, and numerous other formats. These technologies not only establish cost-effective communication channels and access to information but also serve as tools for interactive participation and fostering cooperation among individuals, such as college students guiding and encouraging diversified online activities (Xu et al., 2019). This global-level collaboration is facilitated by the proper and effective use of technology in various digital environments (Isman & Gungoren, 2014; Kim & Choi, 2018; Searson et al., 2015).

Barlow (2010) stated that “with the development of the internet and widespread use of computer networks, we find ourselves in a technological era poised to bring about the most significant change since the discovery of fire.” However, many individuals appear to lack the skills and knowledge required to fully harness these opportunities. They continue to struggle with mitigating the impact of online risks, included a lack of comprehension regarding rights and responsibilities in the digital era (Hallam & Zanalla, 2017; Salehan & Negahban, 2013; Warts et al., 2017). Therefore, the parallel development of teaching and learning management alongside the curriculum's professional skills is a crucial matter. Emphasizing this alignment is essential for achieving tangible outcomes that address the genuine needs of students and resonate with feedback from graduates. Given the aforementioned challenges, the development of teaching and learning strategies for digital citizenship is a pressing matter that requires thorough examination and proposition as a significant model for enhancing university course content.

Digital citizenship in the 21st century

The digital world presents new opportunities and challenges for 21st-century citizens, spanning economic, political, and learning realms. Digital citizenship is an important concept and practice that empowers individuals to harness digital technology effectively while safeguarding themselves from risks, upholding their rights, and assuming responsibility within modern society. This encompasses understanding the impact of digital technology on society and utilizing it to foster positive social change.

Furthermore, positive influencing factors on digital citizenship include communication sharing, collaboration, critical thinking, creativity, and problem-solving skills (Xu et al., 2019). Additionally, a significant emphasis on ethical aspects (Farmer, 2011; Kim & Choi, 2018) is crucial for responsible behavior in the online environment. The internet and its transformation appear in two dimensions: 1) as a revolution in communication technology, and 2) as a revolution giving rise to new social outcomes in the realms of economics, society, politics, and the daily lives of individuals.

The Internet has democratized communication resources, making them more affordable and no longer the exclusive domain of a select few powerful individuals. In the past, owning a television station required significant capital and political connections, but today, this landscape has shifted. This attribute is what has earned the internet the reputation of being a "technology that fosters communication democracy," as it grants everyone communication resources. The internet empowers users to not only consume information but also become content creators, enabling them to distribute their content to a broader audience. According to several previous studies;

a) Knowledge dimension regarding media and information: digital citizens should possess the knowledge to access, use, create, evaluate, synthesize and communicate information through digital tools (Choi, 2016; Clark, 2009; Ribble, 2012). These tools, such as computers, smartphones, and tablets, enable the development of advanced cognitive skills, including critical thinking, which is essential for selecting, categorizing, analyzing, interpreting, and understanding information.

b) Ethical dimension: How can digital citizens use the internet safely, and responsibly while adhering to ethical standards? A responsible citizen must possess an understanding of the values and ethics associated with technology use, along with awareness of the social, political, economic, and cultural implications of internet use. This encompasses knowledge of online rights and

responsibilities, including freedom of speech, respect for intellectual property, and safeguarding oneself and the online community from various risks, such as online bullying (Livingstone et al., 2015; Oksanen et al., 2014; Robinson, 2013), child pornography, spam, and others. For example, Flores & James (2013) discovered three teenage concepts, firstly, self-reflection; secondly, ethics (Jwaitell & Alkhales, 2019), thirdly, ethical thinking.

c) Political and social participation: Digital citizens should understand how to harness the internet's potential for engagement in political, economic, and social participation. The internet serves as a tool to increase political involvement within the system (Choi, Glassman & Cristol, 2017; Min, 2010), enabling activities such as gathering public opinions before enacting laws, electronic voting (e-voting) or online petition. Furthermore, it facilitates the promotion of civil politics through innovative methods that challenge structural political transformation (Choi, 2016; Nam, 2012).

In summary, being a responsible digital citizen involves having a skill set and knowledge in technology and advanced thinking, commonly referred to as "digital literacy." This digital literacy enables individuals to leverage the wealth of information available in the cyber realm (Choi, 2016; Robinson, 2013). Digital citizenship also entails the ability to protect oneself from diverse online threats, understanding both rights and responsibilities, and upholding crucial ethical values in the digital era. Furthermore, it empowers individuals to engage actively in the political, economic, and socio-cultural dimensions of the digital sphere.

In a digital landscape brimming with vast information, there's a demand for skills and digital literacy encompassing the capacity to access, evaluate, utilize, and generate information.

Furthermore, gaining an understanding of the concepts of privacy and digital security is crucial for individuals to thrive in a contemporary economic society and safeguard themselves from online threats (Ribble & Bailey, 2005) particularly concerning the management of personal data.

In particular, it is imperative for every digital citizen to share information online while safeguarding the privacy of oneself and others. They should be mindful of digital equity, honoring the rights of all individuals, which includes exercising discretion in safeguarding their own digital information within a digital society. Being aware of what information should be made public and effectively managing the risks associated with their data on digital social media platforms is crucial.

Moreover, as members of society, acquiring knowledge and comprehension of online rights and responsibilities are foundational aspects of responsible digital citizenship (Choi, 2016; Isman & Gungoren, 2014; Ribble et al., 2004).

Learning behavior of university students

University students' learning behavior was examined through various patterns in surveys. Mata-Domingo and Guerrero (2018) found that the willingness to respect, educate, and protect oneself or others affected the expansion of norms in a digital application, while males exhibiting better application skills than females. Ribble (2014) suggested that digital citizenship extends beyond being a mere teaching tool; it is a concept that empowers individuals to use technology correctly and responsibly. This includes fostering appropriate online conduct and engaging in online civic participation (Jones & Mitchell, 2016). Learners should be instructed on how to acquire knowledge effectively, regardless of when or where they are learning (Ribble & Bailey, 2005). Conversely, Jwaifell and Alkhales (2019) discussed the improper use of technology by university students in the Middle East as an indicator of deficient digital citizenship, highlighting various perspectives on the matter.

Elevated social engagement on digital platforms, including internet addiction (Salehan & Negahban, 2013), sharing of personal information (Hallam & Zanalla, 2017), and cyberbullying (Warts et al., 2017) has been observed. The online environment is susceptible to negative comments, often involving slanderous remarks or attempts to harm others, potentially leading to defamation lawsuits. Also, in a Turkish university, an additional observation regarding the repercussions of technology misuse has been made. Students exhibit a moderate level of digital citizenship, with the lowest engagement seen in online political activities. Interestingly, their technical skills are at the highest level (Erdem & Kocyigit, 2019), suggesting that students may not place the appropriate emphasis on public participation in asserting their rights or benefits.

In consideration of the preceding statements, the research questions were formulated as follows: Firstly, what is the proficiency level exhibited by university students in the domain of digital learning skills? Secondly, what constitutes an appropriate and effective model of digital citizenship tailored to the exigencies of the 21st century?

Method

Research Design

This research aims to explore the digital learning skills of university students in Thailand and analyze effective models of digital citizenship in the 21st century. The study utilized a quantitative approach.

Participants

The study includes a total of 434 individuals, comprising students in their 3rd and 4th year during the academic year 2021 and alumni who have graduated within the past five years.

The study employed stratified a random sampling method, delineating discrete subgroups based on variables encompassing the academic year of enrollment (specifically, the 3rd and 4th-year cohorts), academic faculty affiliation, and alumni status. Subsequently, random samples were meticulously drawn from each of these distinct strata, ensuring the independent selection within each subgroup.

The study's participants exhibited the following demographic characteristics: A significant majority were female, comprising 70% of the sample. Moreover, approximately 50.7% of the participants were in their third or fourth year of academic study. In terms of occupational status, the most significant portion of the sample comprised students, making up 54.8% of the participants, followed by private employees at 16.1%. Furthermore, a majority of respondents reported an income level below 601 USD (1 USD = 33.34 Baht), with 89.3% falling into this income bracket, as shown in Table 1.

Table 1

Demographic of Participants

Status	Statement	Percentage
Gender	Male	30
	Female	70
Group	3 rd to 4 th year student	50.7
	Graduates	49.3
Education	Undergraduate	49.3
	Bachelor's degree	41.9

Career	Postgraduate	8.8
	Student	54.8
	Public servant/ public officer	7.8
	Trading / personal business/ freelance	6.9
	Private employees	16.1
	General labor	10.6
	Unemployed	3.7
Income (Monthly)	Less than 150 USD	35.9
	150-300 USD	26.7
	301-600 USD	26.7
	601- 900 USD	9.2
	More than 900 USD	1.4

Data Collection Tools

The questionnaire consists of four sections, including demographic factors (gender, group, education level, career, monthly income), digital expression behavior (20 items), digital citizenship characteristics (28 items), and digital outstanding characteristics (9 items). Three experts in the subject matter assessed the content validity. The internal consistency reliability of the questionnaire ranged from 0.632 to 0.752, with a total reliability of 0.713.

Data Collection

The online survey was administered to the sample group through Google Forms during November to December 2021.

Data Analysis

Descriptive and inferential statistics were analyzed using SPSS for Mac, including frequency, percentage, standard deviation, and structural equation modeling (SEM) through software analysis. The assumptions for the structural equation model (SEM) were evaluated based on the normal distribution of data, with skewness values ranging from -1.562 to -0.298 (between ± 2) and kurtosis values ranging from -1.254 to 3.578 (between ± 7). The test of normality was significant at a confidence level of less than 0.05, and there were no missing data. Additionally, multivariate normality testing was accepted at a level of 0.05, and appropriate variable selection was used to build the model. Regarding the model fit indices criteria of this case, all criteria were deemed

acceptable: Chi-square = 2343.19, df = 1328, $\chi^2/df = 1.76$, $p = 0.00$, GFI = 0.71, AGFI = 0.67, CFI = 0.98, RMSEA = 0.06.

Findings

The analysis findings, depicted in Figures 2, and Table 2, provide valuable insights to address the research objectives as outlined below:

The digital learning skills of university students were examined from three perspectives: digital expression behavior, digital citizenship, and digital outstanding features. Concerning digital behavior, two latent variables were considered: identity and outstanding and appropriate participation. The factor loading values for the identity variable ranged from 0.66 to 2.02. The highest loading was observed for illegal forwarding (I5 = 2.02), followed by sharing photos or videos without permission (I4 = 1.91). Concerning outstanding and appropriate participation, the factor loading values ranged from 1.21 to 1.91. The highest correlations were found for making new friends, acquiring knowledge, and engaging with society (P7 = 1.91), supporting and praising individuals who perform good deeds (P2 = 1.19), and disclosing personal information (P3 = 1.47). In the context of digital citizenship, three latent variables were examined: digital manner, creative use, and intelligence. For the digital manner variable, the factor loading values ranged from 0.84 to 0.95. The statements with the highest loadings were associated with refraining from violating digital intellectual property (M5 = 0.95), achieving a balance between online and offline life (M7 = 0.94), and preventing digital bullying (M11 = 0.93).

In terms of creative use, the factor loading values ranged from 0.81 to 0.91. The statement with the highest loading was associated with utilizing a reliable source or website for digital purchases (C3 = 0.91), followed closely by statements about building good relationships, recognizing opportunities, and engaging in smart online buying and selling (C6, C1, and C2 = 0.85), respectively.

The analysis delved deeper into the digital citizenship construct, which comprised three latent variables: digital manner, creative use, and intelligence. Regarding the intelligence variable, the factor loading values ranged from 0.64 to 0.91. Notably, statements with high factor loadings included utilizing digital media to pursue personal interests (In3 = 0.91) and refraining from intentionally sharing potentially harmful visual or textual content (In1 = 0.87).

The digital features construct consisted of nine statements, with factor loading values ranging from 0.60 to 0.86. Notably, there were high factor loadings for digital rights and responsibilities, including the expression of ideas in a safe online environment and the respect for privacy and security ($F6 = 0.86$). Additionally, digital physical and mental health ($F7 = 0.83$) and digital literacy, which signifies the ability to effectively use digital tools for educational, professional, and recreational purposes ($F4 = 0.83$), also exhibited substantial factor loadings.

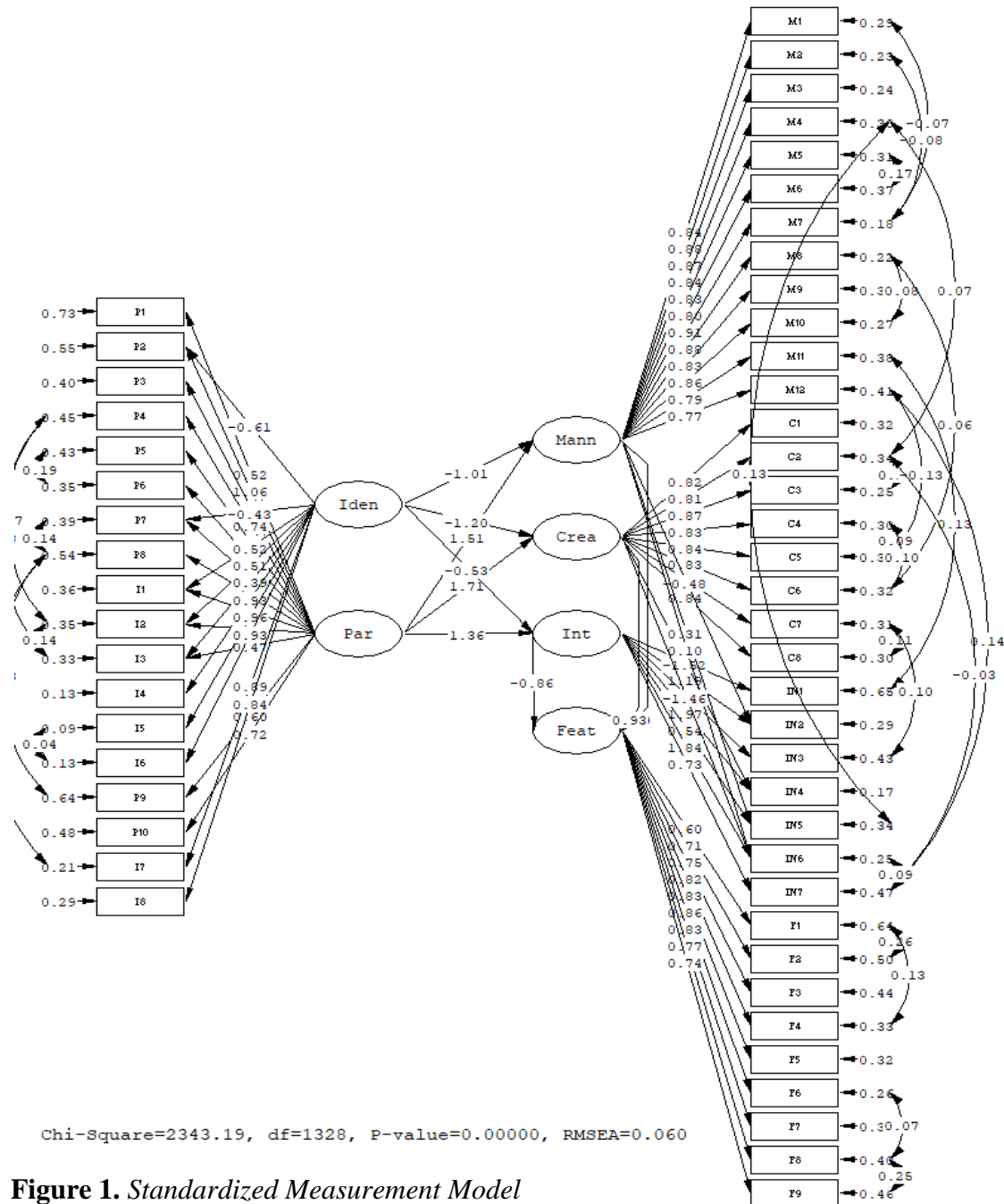


Figure 1. Standardized Measurement Model

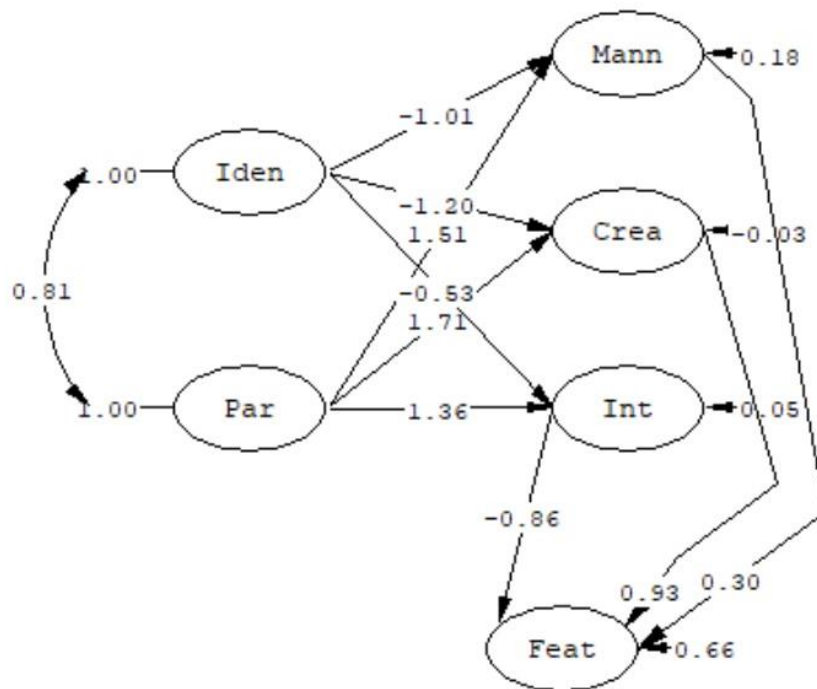


Figure 2. *Structural Model*

As depicted in Figure 2 and Table 2, the results of a structural equation model illustrate the relationship between four factors (digital manners, creative use, identity, and digital outstanding features) and two outcomes (identity and outstanding and appropriate participation). The table includes regression coefficients along with their standard errors, encompassing total effects, indirect effects, and direct effects, all enclosed in parentheses. The results suggest that the digital manners and creative use factors have a positive and significant effect on both outcomes (identity and outstanding and appropriate participation). However, the digital intelligence factor has a negative but non-significant effect on both outcomes.

The digital outstanding features factor exerts a positive effect on outstanding and appropriate participation but does not have a significant impact on digital intelligence features. The R² values indicate that the model explains 82% of the variance in digital manners, 103% of the variance in creative use, 95% of the variance in digital intelligence, and 34% of the variance in digital features. The correlation matrix displays the correlations between the four factors and two outcomes. The diagonal values represent the square root of R² for each factor. The findings suggest that digital manners, creative use, and outstanding and appropriate participation exhibit strong correlations

with each other, while identity displays weaker correlations with the other factors. Furthermore, this text presents the findings of a study that analyzed the direct, indirect, and total effects of different factors on digital features.

Table 2

The Analysis of Digital Features (Direct Effects: DE, Indirect Effects: IE, and Total Effects: TE)

Factors	Mann			Crea			Int			Feat		
	TE	IE	DE	TE	IE	DE	TE	IE	DE	TE	IE	DE
Iden	-1.16 (0.21)	-	-	-1.36 (0.23)	-	-	-0.62 (0.15)	-	-	-0.98 (0.21)	-0.98 (0.21)	-
Par	2.11** (0.28)	-	2.11** (0.28)	2.35** (0.31)	-	2.35** (0.31)	1.90** (0.30)	-	1.90** (0.30)	1.08** (0.22)	1.08** (0.22)	-
Mann	-	-	-	-	-	-	-	-	-	0.26* (0.16)	-	0.26* (0.16)
Crea	-	-	-	-	-	-	-	-	-	0.85** (0.22)	-	0.85** (0.22)
Int	-	-	-	-	-	-	-	-	-	-0.77 (0.17)	-	-0.77 (0.17)
Chi-square = 2343.19, df = 1328, $\chi^2/df = 1.76$, p = 0.00, GFI = 0.71, AGFI=0.67, CFI = 0.98, RMSEA = 0.06												
Structural equation	Mann			Crea			Int			Feat		
R ²	0.82			1.03			0.95			0.34		
	Mann	Crea		Int	Feat	Iden		Par				
Mann	1.00											
Crea	0.92	1.00										
Int	0.82	0.90		1.00								
Feat	0.44	0.43		0.21	1.00							
Iden	0.22	0.20		0.57	-0.25	1.00						
Par	0.69	0.74		0.93	0.09	0.81		1.00				

*p < 0.05, **p<0.01

Note: Iden= identity, Par= outstanding and appropriate participation, Mann= digital manners, Crea= creative use, Int = digital intelligence, Feat= digital outstanding features

The findings reveal that digital manners and creative use have a positive effect on digital features. Digital manners demonstrate a significant effect at a 0.05 level ($\beta = 0.26$) and creative use exhibits a significant effect at a 0.01 level ($\beta = 0.85$). Outstanding and appropriate participation exerts a positive indirect impact on digital features, displaying a significant effect at a 0.01 level ($\beta = 1.08$), while identity has an indirect negative impact on digital features ($\beta = -0.98$). None of the factors exhibit a direct or indirect effect on digital features, except for outstanding and appropriate

participation, which has a good positive direct effect on digital manners ($\beta = 2.11$), creative use ($\beta = 2.35$), and intelligence ($\beta = 1.90$), all significant effects at a 0.01 level.

The correlation matrix reveals positive correlations among the variables, with coefficients ranging from 0.20 to 0.93. Notably, identity and digital features exhibit a negative correlation of -0.25. The highest correlation coefficient is observed between outstanding and appropriate participation and intelligence, standing at 0.93.

Discussion

In pursuit of the research objectives, which encompassed 1) exploring digital learning skills and 2) analyzing effective models of digital citizenship among undergraduate students in the 21st century, the study yielded interesting empirical data pertaining to five key digital citizenship characteristics. These characteristics include identity, outstanding and appropriate participation, digital manners, creative use, and intelligence.

For digital attributes, the highest averages were observed in digital rights and responsibilities, digital physical and mental health, and digital literacy. These factors might be serve as indicators of the success achieved in the general education course thus far, as they predominantly exhibit positive signs. In contrast, the aspects of “using digital media to exploit one's own interests,” “illegal forwarding,” and “share photos or videos without permission” should be given special attention, as they display the highest correlation with digital citizenship perspective.

Moreover, Jwaifell and Alkhaless (2019) provided empirical validation for the notion of digital manners by demonstrating that feedback turned negative when technology was employed inappropriately across various contexts. This finding was referred to by several researchers (Farmer, 2011; Kim & Choi, 2018; Livingstone et al., 2015; Oksanen et al., 2014; Robinson, 2013) in terms of ethical aspects. Similar to digital communication with fewer digital features, it could be argued, following Flores and James (2013), that the internet is viewed as a social setting where young people experience a sense of freedom from adult control, leading to potential conflicts and imbalances when interacting with others online (Bradley, 2005; Carlo et al., 1999). Hence, these assertions should evolve promptly in any future-implicated course.

Outstanding and appropriate participation (i.e., building new friends, acquiring knowledge, contributing positively to society, and endorsing those who perform good deeds) in digital behavior aligns with digital citizenship (Choi, 2016; Isman & Gungoren, 2014; Ribble et al., 2004;

Ribble, 2012), while addressing the issue of “disclosing personal information” represents a significant area for improve (Ribble & Bailey, 2005).

This is a matter of important concern, as indicated by previous research (Bradley, 2005; Carlo et al., 1999; Hallam & Zanalla, 2017; Sallehan & Negahban, 2013; Warts et al., 2017), which portrays social media as a platform where young people perceive independence from adult control during online interactions.

It is evident that this variable encompasses the evolution of idea exchange in innovative and unique social contexts, consistent with the findings of Gleason and Gillern (2018), who conducted an experiment in online social spaces to explore the principles and diverse learning opportunities beyond conventional boundaries, thereby fostering the development of unique learning experiences.

It is suggested that teachers should consider integrating sciences into the classroom using social media. In essence, when the communication style revolves around digital interactions, classroom modeling is probably an effective approach for adapting the teaching style to align with distinctive behavior of learners. Furthermore, Xu et al. (2019) affirmed the significance of digital citizenship skills in communication sharing, highlighting their positive impact citizenship, and put forth recommendations for promoting these skills among university students.

Creative use: Creatively harnessing a source or website for digital purchases, fostering strong relationships, acknowledging others to leverage opportunities, and making astute online buying and selling decisions align with the research findings of Choi (2016), Clark (2009), and Ribble (2012). They contended that digital citizenship necessitates proficiency in accessing, utilizing, generating, synthesizing, and conveying information using digital tools. Moreover, the core principles of digital citizenship encompass comprehending online rights and responsibilities (Isman & Gungoren, 2014; Ribble et al., 2004). The construct of intelligence variable, as evidenced by the factor loading values, highlights the inclination of undergraduate students to employ digital media for pursuing their individual interests. This behavioral trait has raised concerns in previous studies (Choi, 2018; Farmer, 2011; Jwaitell & Alkhales, 2019).

Based on the model analysis of empirical data concerning outstanding digital features, three influencing factors emerge: Outstanding and appropriate participation, digital manners, and creative usage. Remarkably, outstanding and appropriate participation directly impacts all three factors, including digital manners, creative usage, and digital intelligence. Therefore, the general

education course in the future should be improved and managed in accordance with these identified factors.

These findings emphasize the importance of integrating these elements into general education courses to enhance students' digital learning skills. This aligns with previous studies that emphasize the role of educational institutions in equipping students with necessary skills and knowledge to navigate the digital landscape effectively (Kirschner & De Bruyckere, 2017; Selwyn, 2016). Furthermore, these findings align with the recommendations of the European Commission's Digital Education Action Plan, emphasizing the necessity of preparing students to become engaged and responsible citizens in the digital age (European Commission, 2021). Otherwise, although some research has emphasized the importance of integrating digital citizenship elements into general education courses to improve students' digital learning skills (Choi, 2018; Jwaitell & Alkhales, 2019), other research has suggested that such initiatives might not yield the intended results. Livingstone et al. (2011) found that digital citizenship education was widely implemented in European schools, but often delivered in a fragmented and inconsistent manner, lacking well-defined objectives and assessment standards. In a similar vein, Ribble et al. (2012) argued that digital citizenship education may not prove effective in promoting positive online behavior unless accompanied by more extensive shifts in social norms and values. These findings indicate a requirement for further research to identify effective strategies for integrating digital citizenship education into general education courses. These disparate findings underscore the importance of further study aimed at devising effective techniques for incorporating digital citizenship components into general education curricula.

Conclusion and Implications

The digital citizenship skills that undergraduate students need to develop through a general education course encompass digital behavior (identity, outstanding and appropriate participation), digital citizenship (digital manners, creative use, and digital intelligence), digital features (digital rights and responsibility, digital physical and mental health, and digital literacy). Also, it identified the impact of digital outstanding features displayed these factors, encompassing outstanding and appropriate participation, digital manners, and creative use while noting a negative influence of identity and digital intelligence.

The research findings validate that digital skills have a significant impact on digital citizenship, especially with regard to the prominent features of digital intelligence. This aligns with prior research; however, what adds intrigue is that the variables predicting digital intelligence are associated with negative traits that should ideally be avoided. Therefore, further in-depth research should focus on these three characteristics to corroborate the findings in various domestic and international contexts and settings. Moreover, the findings identify both positive and negative digital characteristics at a good level. Therefore, it is crucial to underscore the integration of these findings into the departments to improve the curriculum for learners. This is underscored by the correlation observed among the five identified variables: outstanding and appropriate participation, digital manners, creative use, and digital intelligence.

The management of digital citizenship skills, in line with the findings, would constitute a fitting response to the objectives outlined in Thailand's Twelfth National Economic and Social Development Plan (2017-2021), particularly under the first plan, which pertains to national strategy development and the enhancement of human resource capacity. Moreover, as a recommendation, the ability to develop digital citizenship skills is highly valuable for educators, curriculum designers, and policymakers, especially in fostering awareness among students regarding the appropriate and effective use of digital technology. Educators can leverage their knowledge and skills in digital citizenship to advance and facilitate the creation of relevant curricula geared toward preparing students for a digital-centric future. Furthermore, the cultivation of digital citizenship skills can aid curriculum designers in refining their teaching plans to enhance students' proficiency in digital citizenship. Policymakers can also derive benefit from the development of digital citizenship skills by incorporating them into national development plans, such as human resource development and capacity building. The model exhibited an ideal fit when applied to the chosen domain, employing the theoretical framework of digital citizenship. Further confirmation of the findings would be strengthened by implementing the research tool in different contexts.

Acknowledgment

This article is based on a research project titled “The development of teaching and learning model to promote digital citizenship for general education course.” The author extends gratitude for the funding support received through Grant No. INS64D0903 from Rajamangala University of

Technology Thanyaburi, which was officially approved by the Institutional Review Board (IRB) under No. RMUTT_REC No. Exp 36/64.

References

- Barlow, J.P. (2010). "Is there a there in cyberspace?" *Utne Reader* (March-April 1995): 50–56, Quote in Barry Wellman, "Studying the Internet Through the Ages," in *The Handbook of Internet Studies*, edited by Robert Burnett, Mia Consalvo and Charles Ess (Wiley-Blackwell, 2010).
- Bradley, K. (2005). Internet lives: Social context and moral domain in adolescent development. *New Directions for Student Leadership*, 2005(108), 57–76. <https://doi.org/10.1002/yl.142>
- Carlo, G., Fabes, R.A., Laible, D., & Kupanoff, K. (1999). Early adolescence and prosocial/moral behavior II: The role of social and contextual influences. *The Journal of Early Adolescence*, 19(2), 133–147.
- Choi, M., Glassman, M., & Cristol, D. (2017). What it means to be a citizen in the internet age: Development of a reliable and valid digital citizenship scale. *Computer and Education*, 107, 100–112. <https://doi.org/10.1177/0272431699019002001>
- Choi, M. (2016). A concept analysis of digital citizenship for democratic citizenship education in the internet age. *Theory and Research in Social Education*, 44(4), 565–607. <https://doi.org/10.1080/00933104.2016.1210549>
- Choi, M. (2018). Digital citizenship education for pre-service teachers: A critical review. *Journal of Educational Technology & Society*, 21(1), 216–228. <https://doi.org/10.3991/ijet.v14i13.11127>.
- Clark, L.S. (2009). Digital media and the generation gap. *Information, Communication and Society*, 12(3), 388–407. <https://doi.org/10.1080/13691180902823845>
- Erdem, C. & Kocyigit, M. (2019). Student misbehaviors confronted by academics and their coping experiences. *Educational Policy Analysis and Strategic Research*, 14(1), 98–115. doi: 10.29329/epasr.2019.186.6
- Erdem, C., & Koçyiğit, M. (2019). Exploring undergraduates' digital citizenship levels: adaptation of the digital citizenship scale to Turkish. *Malaysian Online Journal of Educational Technology*, 7(3), 22–38. DOI:10.17220/mojet.2019.03.003
- European Commission. (2021). *Digital education action plan*. Retrieved July 01, 2022, from <https://education.ec.europa.eu/document/digital-education-action-plan-factsheet-2018>
- Farmer, L. (2011, January 22). Teaching digital citizenship. In C. Ho & M. Lin (Eds.), *Proceedings of E-Learn 2011--World Conference on E-Learning in Corporate, Government,*

- Healthcare, and Higher Education* (pp. 99–104). Honolulu, Hawaii, USA: Association for the Advancement of Computing in Education (AACE). <https://www.learntechlib.org/primary/p/38680/>.
- Flores, A., & James, C. (2013). Morality and ethics behind the screen: young people's perspectives on digital life. *New Media and Society*, 15(6), 834–852. <https://doi.org/10.1177/1461444812462842>
- Gleason, B., & von Gillern, S. (2018). Digital citizenship with social media: Participatory practices of teaching and learning in secondary education. *Educational Technology & Society*, 21(1), 200–212.
- Hallam, C. & Zanalla, G. (2017). Online self-disclosure: the privacy paradox explained as a temporally discounted balance between concerns and rewards. *Computer in Human Behavior*, 68, 217–227. <https://doi.org/10.1016/j.chb.2016.11.033>
- Isman, A., & Gungoren, O. (2014). Digital citizenship. *The Turkish Online Journal of Educational Technology*, 13(1), 73–77.
- Jwaifell, M., & Alkhales, B. (2019). The proper use of technologies as a digital citizenship indicator: A comparative study of two universities in the Middle East. *Journal of Studies in Education*, 9(1), 1–16. <https://doi.org/10.5296/jse.v9i1.14079>
- Jones, I.M., & Mitchell, K.J. (2016). Defining and measuring youth digital citizenship. *New Media and Society*, 18(9), 2063–2079. <https://doi.org/10.1177/1461444815577797>
- Karen Mossberger, Caroline J. Tlobert, & Ramona S. McNeal. (2011). *Digital citizenship: The internet, society and participation*, The MIT Press.
- Kim, M., & Choi, D. (2018). Development of youth digital citizenship scale and implication for educational setting. *Educational Technology & Society*, 21(1), 155–171.
- Kirschner, P. A., & De Bruyckere, P. (2017). The myths of the digital native and the multitasker. *Teaching and Teacher Education*, 67, 135–142. <https://doi.org/10.1016/j.tate.2017.06.001>
- Livingstone, S., Mascheroni, G., & Staksrud, E. (2015). *Development a framework for researching children's online risks and opportunities in Europe*. LSE, EU Kids Online.
- Mata-Domingo, S., & Guerrero, N. (2018). Extend of students' practices as digital citizens in the 21st century. *Research in Social Sciences and Technology (RESSAT)*, 3(1), 134–148.
- Min, S.J. (2010). From the digital divide to the democratic divide: Internet skills, political interest, and the second-level digital divide in political internet use. *Journal of Information Technology & Politics*, 7(1), 22–35.
- Nam, T. (2012). Dual effects of the internet on political activism: reinforcing and mobilizing.

Government Information Quarterly, 29(1), 90–97.
<https://doi.org/10.1016/j.giq.2011.08.010>

- Oksanen, A., Hawdon, J., Holkeri, E., Nasi, M., & Rasanen, P. (2014). “Exposure to online hate among young social media users,” *soul of society: A focus on the lives of children and Youth. Sociological Studies of children and Youth*, 18, 253–273.
<https://doi.org/10.1108/S1537-466120140000018021>
- Robinson, E. (2013). Parental involvement in preventing and responding to cyberbullying. *Family Matters*, (92), 68–76.
- Ribble, M. (2012). Digital citizenship for educational change. *Kappa Delta Pi Record*, 48(4), 148–151. <https://doi.org/10.1080/00228958.2012.734015>
- Ribble, M. (2014). Digital citizenship in schools. *International Society for Technology in Education*. International Society for Technology in Education.
- Ribble, M.S., Bailey, G.D., & Ross, T.W. (2004). Digital citizenship: addressing appropriate technology behavior. *Learning and Leading with Technology*, 32(1), 6–9.
- Ribble, M., & Bailey, G. (2005). *Is digital citizenship a problem in your school? (Teaching digital citizenship)*. McGraw Hill Publications.
- Ribble, M., Bailey, G. D., & Ross, T. W. (2012). Digital citizenship: Addressing appropriate technology behavior. *Learning & Leading with Technology*, 39(5), 10–14.
- Salehan, C., & Negahban, A. (2013). Social networking on smartphone: when mobile phones become addictive. *Computer in Human Behavior*, 29, 2632–2639.
<https://doi.org/10.1016/j.chb.2013.07.003>
- Searson, M., Hancock, M., Soheil, N. & Shepherd, G. (2015). Digital citizenship within global contexts. *Education and Information Technologies*, 20, 729–741.
- Selwyn, N. (2016). *Education and technology: Key issues and debates*. Bloomsbury Publishing.
- Warts, L.K., Wagner, J., Velasquez, B., & Behrens, P.I. (2017). Cyberbullying in higher education: A literature review. *Computers in Human Behavior*, 69, 268–274.
<https://doi.org/10.1016/j.chb.2016.12.038>
- Xu, S., Yang, H.H., & Zhu, S. (2019). An investigation of 21st century digital skills on digital citizenship among college students. *2019 International Symposium on Educational Technology (ISET)*, 236–240. DOI:10.1109/ISET.2019.00056