Developing Thai Undergraduate Online Digital Citizenship Skills (DCS) Under the New Normal

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The study aims to develop a model and assess the suitability of a digital citizenship skills (DCS) model for online teaching and learning for Thai undergraduate students. In-depth interviews and content analysis from seven Thai academic experts in 2020 were used for the analysis. The experts' questionnaires suitability was analyzed using propriety standards, utility standards, feasibility standards, and accuracy standards as outlined by the Joint Committee on Standards for Educational Evaluation (JCSEE). After that, descriptive statistics including the mean and standard deviation (SD) were used to assess the results from the five-level agreement scale used. The final DCS model consisted of five components. These included the learner (L), the instructors (I), the Internet, intranet, and extranet network components (I), the platform component for online teaching, and information and communication technology (ICT) enabled devices (P), and personalized learning (P) (LIIPP Model). Overall model suitability according to the experts' input was judged to be at a very high level (mean = 4.61, SD = .51).

Keywords: Digital Learning Ecosystem, LIIPP Model, personalized learning, Thailand

INTRODUCTION

A learning style that is being explored in the quest to achieve 21st-century learning goals is the integration of digital technologies and teaching management tools into a form of '*digital learning ecosystem*'(DLE) (Gütl & Chang, 2008; Kummanee et al., 2020). Moreover, other authors have suggested that ecosystem development and implementation are useful tools across a broad spectrum of human-generated processes and structures (Pickett & Cadenasso, 2002). Therefore, studying how a DLE can complement a child or young adult's development can create a new progressive educational paradigm in which a learning society progresses to a society of cognition with learning.

Furthermore, a DLE has the potential to take non-traditional digital learning methods and techniques and diversity and shift the paradigm towards a student-centered approach. This paradigm shift to digital learning across multiple platforms (flipped, blended, and e-learning) has gone far beyond acceptance.

Reasons for this are that there are excellent tools for creating student creativity, critical thinking, computational skills, and motivation for something that has become a critical necessity for education (the New Normal) under the onslaught of a global pandemic (Klein-Collins & Travers, 2020).

Additionally, a DLE can also function as an enabler of a '*social ecosystem model*' (SEM). Within this SEM context, learners can interact with each other through different tools or communities, tapping into a wide variety of experts worldwide (Laanpere et al., 2013). This is consistent with a G20 report, in which a '*social ecosystem model*' was stated as potentially a new educational paradigm for the development of an individual's skills (Grainger & Spours, 2018). Moreover, a combination of a DLE and an SEM can potentially empower the *Generation Z* youth with *digital citizenship skills* (DCS) and *appropriate Internet behavior* (AIB) (García-Umaña & Tirado-Morueta, 2018; Helsper & Smahel, 2020; Leekitchwatana & Pimdee, 2021; Ruenphongphun et al., 2021).

Furthermore, Ghosn-Chelala (2019) have added that student DCS and their use of ICT in developing countries such as Lebanon are pivotal to their participation and development in society. The author also added that digital citizenship is concerned with how individuals effectively participate in a world of online communities. Moreover, with the COVID 19 global pandemic forcing more institutions, educators, and students online, the better use and understanding of digital devices has increased in importance (Coskun-Setirek & Tanrikulu, 2021). An *appropriate Internet behavior* model can be crucial in promoting children and young adults' proper use of the Internet and DCS in a digital age.

Therefore, numerous global initiatives are now underway to guide learners in acquiring DCS. Leading educational thinkers and entrepreneurs have also strongly believed that *personalized learning* unlocks academic achievement with higher than average assessment scores. Unfortunately, just how much has become a point of deep controversy (Barnum, 2018). However, in a United States (US) study from a report from the International Association for K–12 Online Learning (*iNACOL*), the group laid a strong foundation for the support of personalized learning's educational strengths through online learning (Friend, Patrick, Schneider, & Vander Ark, 2017).

Also, critical takeaways from iNACOL are the ideas that *personalized learning* tailors learning to each individual's strengths, needs, and interests. Moreover, the group states that students should have a '*voice and choice*' in where they learn, how they learn, and what they learn, with instructors acting as facilitators creating flexibility in the learning process (UNESCO, 2020). However, another iNACOL study of 908 US teachers from 38 schools found that the implementation of PL is, unfortunately, being met with slow implementation in traditional formal schools with classrooms only (Gross et al., 2018). As education has been forced online due to COVID-19, means must be found to move *personalized learning* from the traditional classroom into an online world.

The iNACOL survey is also collaborated by a Rand study in the US. The authors state that the significant problems in developing a 21-st century workforce are due to the slow educational evolution of US educational institutions in embracing modern learning models and curricula (Zaber et al., 2019). Nevertheless, another Rand study from the US highlighted that students in schools using PL make more significant progress compared to schools that do not use PL. In contrast, slower learners who used PL for over two years have been shown that they can catch up and then achieve scores at or above the national averages (Pane et al., 2015). The Rand research also found that ICT and digital content significantly increased PL implementation and use.

Furthermore, some attempt PL through alternative online 'schooling' environments and DLEs such as Sal Khan's online *Khan Academy*. As an early innovator in bringing free online learning to students, Khan's concept was to tailor learning modules in which students could move as fast (or slow) as they needed, depending on their 'mastery' of the material. He also believed that test scores were far less important than the student's understanding of the material, labeled as '*mastery-based learning'* (Khan, 2016).

In a global study from the *International Society for Technology in Education* (ISTE), PL was defined as a learning method tailored to students with different interests and preferences (Grant & Basye, 2014). Moreover, ISTE states that the key to student engagement lies with teachers willing to move outside the classroom by connecting and sharing online and building their virtual communities. ISTE also elaborates

on using digital tools to facilitate student-centered learning. The group contributes to practical 21st-century skills, better communication, collaboration, critical thinking, creativity, and problem-solving abilities.

Therefore, providing education and open learning processes is an important channel to promote AIB and DCS knowledge for children and youth. In the age of COVID 19, ways must be found to teach DCS through online mechanisms using platforms comfortable to both early learners and older youth.

These personalized learning and digital skills can thus be used to create better citizens suitable as 21st-century knowledge workers. Some are starting to refer to these ideas in learning management as the '*New Normal*' **(**Amrane-Cooper, 2020). However, around the globe, from Nigeria to Vietnam, problems abound as the Internet and Wi-Fi access are problematic, quiet places to study are also difficult for many, and ICT equipment shortages and Internet connection problems are significant in developing nations and regions (Dayagbil et al., 2021). These problems are also highlighted by other studies globally and within Thailand. The United Nations (2015) Sustainable Development Goal (SDG) 9 states that lack of Internet and digital access can be a factor in circumventing citizenship ideals.

Surprisingly, although Thailand's Generation Z is some of the most connected globally, using the Internet an average of 12.8 hours a day, only 66.7% of the Kingdom's population has access to the Internet (Manakitsomboom, 2021; World Bank. 2019). Comparatively, in the Philippines, only 43.0% of its citizens have access to the Internet. Thus, although online learning and teaching are proven techniques across many educational disciplines, technical issues and natural disasters abound. Therefore, educational leaders must develop digital ecosystems across multiple platforms using redundant connection possibilities, terrestrial and satellite.

LITERATURE REVIEW

Digital Learning Ecosystem (DLE)

In Thailand, a *digital learning ecosystem* (DLE) has been described as using new learning tools and materials to help instructors present information systematically to students (Sarnok et al., 2019). It covers all areas of learning management for learners and facilitates students' access to learning anytime or anywhere (Carrier, 2017). Moreover, multiple authors have suggested that the term '*digital ecosystem*' (DE) can describe ICT and online/e-learning concepts (Reyna, 2011). Also, in e-learning, a DE or DLE has been described as an ecological learning and teaching model (Frielick, 2004). A DLE has also been used to describe and understand e-learning infrastructures (Chang & West, 2006; Gütl & Chang, 2008). Moreover, DLEs are collaborative learning styles in a digital environment, which can be used to create media and delivers experiences through digital storytelling (Sarnok et al., 2019). Also, learners have great flexibility in controlling the time, place, and direction of learning independently.

Furthermore, DLEs are seen as environments consistent with (not antagonistic to) how learners learn (Atif et al., 2010; Giannakos et al., 2016). Moreover, in today's DLE, students can participate in continuous learning through many digital learning resources that can be effectively managed across different environments. Context-focused services and tutors who coach students learn from various learning resources, posing a challenge to develop an appropriate learning system for student learners.

Finally, with the continuous and seemingly never-ending COVID 19 pandemic, the impact on education, learning management, and learning styles have changed forever. Therefore, higher education institutions need to adapt their curricular processes to accommodate modern learning styles and methods of teaching. They also need to emphasize supporting learning environments that connect and integrate learning with learners so that all can be successful (Klein-Collins & Travers, 2020).

Personalized Learning (P)

Digital educational technologies are evolving quickly, and frequently tech-savvy students are ahead of their teachers in understanding its use. However, in this ongoing paradigm shift, teachers can now gather relevant and meaningful data almost in real-time (Twyman, 2018). However, teachers need to adapt their lessons to their student's needs, as technology allows instructors to break away from traditional passive instructional models and make their lessons more interactive. Also, numerous studies indicate that active

student response increases student engagement, and learning outcomes, while also decreasing disruptive behavior.

Personalized learning also uses differentiated instruction in which the learner's instruction is paced to their needs and adjusted to their learning preferences and interests (Taylor & Gebre, 2016). Furthermore, Johns (2018) has reported that PL contains four core ideas necessary for learning success (Figure 1). These ideas revolve around content flexibility, targeted teaching, student reflection and ownership, and the instructor's ability to use data to make decisions. Finally, from the literature review related to personalized learning in a digital ecosystem environment, the authors compiled an overview of several common and reappearing characteristics (Table 1).

FIGURE 1
CORE IDEAS FOR PERSONALIZED LEARNING SUCCESS

Source: Johns (2018).

TABLE 1
PERSONALIZED LEARNING CHARACTERISTICS

Personalized learning characteristics	(Johns, 2018)	(Grant & Basye, 2014)	(DeMink-Carthew et al., 2017)	(Cullhaj, 2017)	(LEAP Innovations, 2021)	(Gross et al., 2018)
Set goals, learning needs, and interests.		✓	✓	✓	✓	✓
Flexible learning content consistent with learning objectives.	✓	✓	✓	✓	✓	✓
Promote reflection and collaboration.	✓	✓	✓		✓	✓
Assess learner learning achievement while also allowing for learner decision-making.	✓	✓		✓	✓	✓
Learner's profile.				✓		

Students participate in their learning design.			✓			
Students 'own' their learning and are responsible for it. This concept of '*voice and choice*' allows students to determine when, how, and what they learn.			✓			

Digital Citizenship Skills (DCS)

UNESCO (2019) has examined youth DCS and noted its growing role and the essential nature of ICT in our lives. This is consistent with the *Center on Innovations in Learning*, in which it is stated that along with incredible opportunities, the use of digital technologies necessitates tremendous responsibility in its ethical and respectful use (Twyman, 2018). Numerous other studies echo the need for DCS education and student education on the appropriate Internet use (AIU) and its respective digital devices and social media platforms (Leekitchwatana & Pimdee, 2021; Ruenphongphun et al., 2021).

Moreover, Ribble (2015) has stated that *digital citizenship* is the continuous development of appropriate and responsible norms which empower their ICT use. Digital citizens should also know how to use digital technology and media safely and responsibly (DQ Institute, 2017). Additionally, *digital intelligence* has been stated to be a process of cognitive, intellectual, emotional, and social competence in the digital age.

Finally, from the literature review related to DCS, the authors developed five components (Table 2) for the proposed DCS learning model (Figure 2).

TABLE 2
DCS LIIPP MODEL THEORY SUPPORT

LIIPP Model Components	(Reyna, 2011)	(Quaicoe et al., 2016)	(Sarnok et al., 2019)	(Morales et al., 2019)	(Kummanee et al., 2020)
Learners (L)	✓	✓	✓	✓	✓
Instructors (I)	✓	✓	✓	✓	✓
Intranet, Internet, and Extranet networks (I)	✓	✓	✓	✓	✓
Platform for online teaching and supporting ICT (P)	✓	✓	✓	✓	✓
Personalized learning (P)	✓			✓	

Study's Objectives

Finally, from the literature review related to DCS, the authors developed five components for the proposed DCS learning model shown in Table 2.

1. The authors' first objective was to conceptualize a digital learning ecosystem model (DLEM) together with a personalized learning management process for online teaching and undergraduate student learning of digital citizenship skills.
2. The authors' second objective was to assess the suitability of the proposed model using a panel of educational experts.
3. Finally, from the expert panel's input, a final DLEM combined with a personalized learning management process was proposed for the online teaching and undergraduate student learning of digital citizenship skills.

METHODS

The literature was synthesized from the documentary analysis, and a conceptual framework was developed. After that, the authors presented the model in 2020 to seven experts who were active Thai university educators. Moreover, each possessed a Ph.D. and had expertise in curriculum and teaching, education, computer studies, computer science, or other ICT-related disciplines. A content analysis was performed using in-depth interviews on the experts' opinions from the initial model presented.

Based on the experts ' comments and suggestions, a revised online teaching and learning model was developed. The DLE was integrated with a personalized learning management process to develop undergraduate students' digital citizenship skills.

Data Analysis

The experts' opinions were analyzed using IBM's® *SPSS*® for Windows Version 21 program. The mean interpretive criteria for the experts' input used 4.50 – 5.00 to indicate that they '*strongly agreed*' with the item's statement. Next on the scale was 2.50 – 4.49 as an indication of '*somewhat agree*' with the item, 2.50 – 3.49 was used to indicate '*moderate agreement*,' 1.50 – 2.49 as '*disagree*,' and finally, 1.00 – 1.49 was used to indicate an answer of '*minimal agreement*.'

RESULTS

The LIIPP Model

The seven experts determined the outcome of developing the digital learning and teaching management ecosystem model for Thai students' digital citizenship skills to include five supporting elements. These were the learner (L), the instructors (I), the physical connectivity, which included the Internet, intranet, and extranets, the online platform for teaching and equipment supporting ICT (P), and finally, the personalized learning (P) and its four sub-components. Thus, the authors labeled it the 'LIIPP Model' (Figure 2).

After that, a suitability assessment was undertaken using a process in which four standards were evaluated. These included *propriety*, *utility*, *feasibility*, and *accuracy* standards (Tongchiw, 2013; Yarbrough et al., 2010). After that, descriptive statistics, including the mean and standard deviation (SD), were used to analyze the data collected. Also, content analysis was used for the learning model's quality assessment using a quality assessment scale that used five levels (McMillan & Schumacher, 2001). The rank and range was 4.51 – 5.00 = 5, 3.51 – 4.50 = 4, 2.51 – 3.50 = 3, 1.51 – 2.50 = 2, and 1.00 – 1.50 = 1.

Digital Learning Ecosystem (DLE) Model Assessment

Table 3 presents the final results from the seven experts' input concerning the suitability of the DLE in conjunction with the personalized learning management process used to develop Thai student DCS.

TABLE 3
SUITABILITY ASSESSMENT RESULTS FOR LIIPP MODEL COMPONENTS

Model components	Experts (*n*=7)		**Results**
	mean	SD	
Learners. (L)	4.57	.53	Strongly agree
Instructors. (I)	4.57	.53	Strongly agree
Internet, intranet, and extranet networks. (I)	4.43	.53	Somewhat agree
A platform for online teaching and ICT support equipment. (P)	4.71	.49	Strongly agree
Personalized learning. (P)	4.71	.49	Strongly agree
Set goals, learning needs, and interests. (P1)	4.71	.49	Strongly agree
Flexible learning content consistent with learning objectives. (P2)	4.71	.49	Strongly agree

Promote reflection and collaboration. (P3)	4.57	.53	Strongly agree
Assessing learning achievement so learners can make informed decisions. (P4)	4.57	.53	Strongly agree

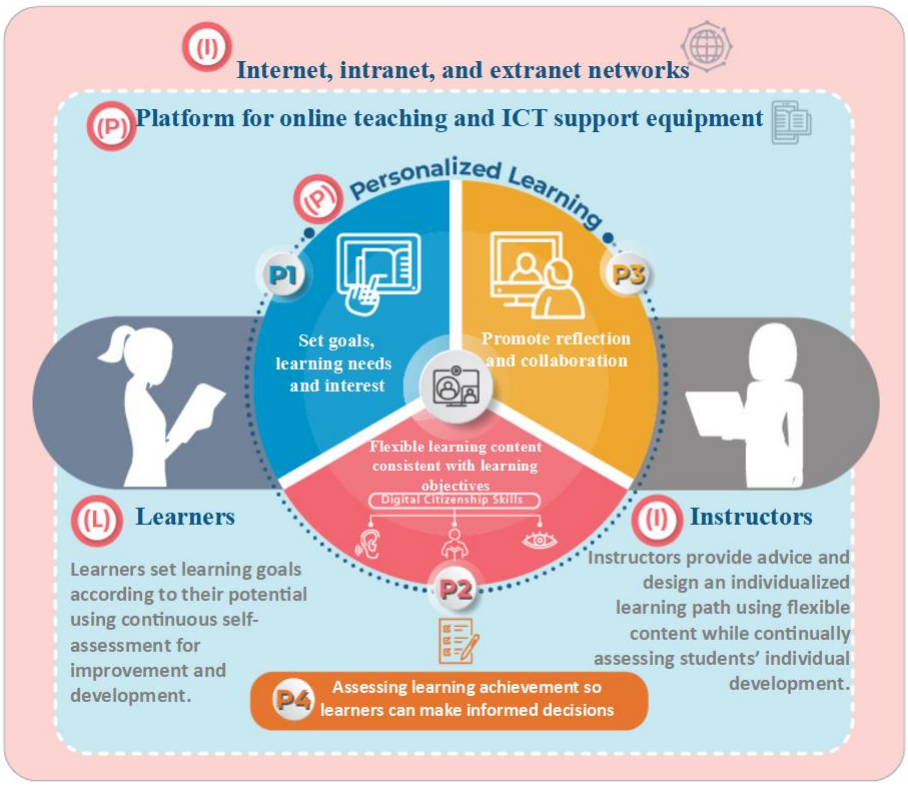
Note. Strongly agree = 4.50 – 5.00, Somewhat agree = 2.50 – 4.49

Table 4 details the experts' standards assessment results concerning the quality of the evaluation activities to ensure that they were well-designed and practical. The data results show that the utility and feasibility standards were very high as both had a mean = 4.71 and SD = 0.49. Overall, the model's quality standard assessment was also very high (mean = 4.61, SD = 0.51).

TABLE 4
PERSONALIZED LEARNING CHARACTERISTICS STANDARDS ASSESSMENT

Module	**Experts (*n*=7)**		**Results**
	mean	**SD**	
Propriety standards	4.57	.53	very high
Utility standards	4.71	.49	very high
Feasibility standards	4.71	.49	very high
Accuracy standards	4.43	.53	high
Overall model suitability	**4.61**	**.51**	very high

FIGURE 2
PROPOSED LIIPP MODEL



DISCUSSION

Learner (L)

Each learner has different learning background and learning goals. Therefore, the learning environment must be organized according to the individual learner's aptitudes, needs, interests, and goals. Achieving this is done through learner surveys on their aptitudes, needs, interests, and goals for learning. Instructor flexibility is then required to create diverse learning styles to meet each student's potential.

Subsequently, teachers need to analyze the data from their customized digital learning ecosystem to support individual learners in a way that appeals to learners (Twyman, 2018). Learners then become involved in designing their own DCS personalized learning pathway (PLP), which can create a fun learning environment. As suggested by methods forming the foundation of the 'Khan Academy,' fast learners can advance at their own pace. In contrast, slower learners can review the material as often as is needed to 'master' the content (Khan, 2016).

In addition, learners are mentored by teachers with digital tools to provide counseling. This is different from the traditional learning style, which requires learning simultaneously and following the same learning plan. Students will also be able to conduct continuous self-assessments before, during, and after school, using the results as feedback for continuous and creative improvements and developments in digital citizenship skills.

Instructors (I)

Instructors are transformed from teaching to advisors, facilitators, mentors, and specialists to impart knowledge on digital citizenship skills (UNESCO, 2020). The instructor is also expected to inspire students to learn while also assisting them in focusing on learning DCS.

Instructors are also expected to design digital tools for exploring aptitudes, needs, interests, and learning goals before learning digital citizenship skills. Moreover, instructors lead students deep into the content of each component of DCS until they are realized using a PLP to provide students with individualized, integrated digital tool mentoring. Finally, the PLP needs to be flexible and based on each learner's interests and goals.

Content flexibility can be achieved by using diverse content-based learning models. Examples include listening, watching, reading, and creating exercises that promote student reflection. Examples of student reflection include worksheet design, case studies, and simulations.

The result enables learners to think, analyze, and solve problems according to simulated situations. Moreover, exercises should also focus on group collaboration, including parental input where and when possible. A community of learning together can be realized by developing a digital learning ecosystem, including the instructors, students, classmates, and parents. Finally, a personalized learning management system ensures that feedback is used to continuously improve and develop individual learners.

Internet, Intranet, and Extranet Networks (I)

Computer networks have evolved beyond computers wired together across a single campus. Today we have a global network of digital devices connected through various technologies and platforms. However, depending on where the 'firewall' sits and where and how access is controlled, we use terms to delineate this by using the Internet, the intranet, and an extranet.

Understanding that there are limitations on access due to security concerns is vital to teachers to some degree. Access can even be blocked to a university network because the student or teacher is accessing it through a virtual private network (VPN). However, teachers are not expected to be experts on these matters, but a little knowledge about these connectivity and security functions can help a teacher's digital learning ecosystem function with minimal hurdles in its implementation.

Platform for Online Teaching and ICT Support Equipment (P)

Once connectivity to 'the network' or 'cloud' is obtained, a wide variety of online platforms and digital tools are available for a teacher's use. However, different tools such as learning management systems

(LMSs) have varying sophistication, complexity, and costs. Setup and customization might not be available to the teacher directly and require outside technical support. Also, language support is another concern for learners whose first language is not English. Therefore, it might be necessary for Thai students and their teachers to select an LMS with a Thai language module interface.

Also, numerous studies and reports discussing the 'new normal' of online learning often find stumbling blocks to their use due to the location of the school and students (Sinlapasakkhajorn & Unaromlert, 2015). Also, in Thailand, multiple studies point to the lack of ICT resources in many rural schools, including software, computers, and reliable Internet connectivity (Phuapan et al., 2015; Watnayoo et al., 2019).

As might be expected, due to low population densities and distance from significant equipment hubs, rural environments often face daily outages and connectivity issues such as speed. Mobile connections and speed also depend on the carrier used and the frequency spectrum available within each area (Srinuan & Srinuan, 2021). Therefore, technological limitation issues have often been the most significant limitations to new learning models such as flipped classrooms and blended learning by teachers and school districts.

However, most limitations can be overcome, and DCS can be taught various ways. In 2022, standard and well-supported learning management platforms include Google Classroom, Moodle, Edmodo, and Schoology. Live streaming is also becoming more and more popular in the COVID 19 era, with tools such as Zoom, Microsoft Team, Google Meet, and Cisco WebEx becoming popular. Additionally, the ICT infrastructure must include the equipment and software necessary for online teaching management. Lastly, digital devices that the infrastructure must support are wide-ranging, including desktop computers, notebooks, tablets, and smartphones.

Personalized Learning (P)

Set Goals, Learning Needs, and Interests (P1)

Personalized learning involves the creation of pre-learning tools to explore each student's aptitudes, needs, interests, and learning goals, which includes a survey of learners before they begin to learn individual DCS (DeMink-Carthew et al., 2017). Moreover, Camacho and Legare (2016) have determined that self-directed learning permits each student to determine their own needs and goals. With this information, a learning path is created in which flexibility is allowed for each student to choose their learning elements based on their needs and interests. Also, depending on the richness of the DCS content, they can choose which media they choose to use (e.g., listening, viewing, or reading).

Furthermore, personalized learning is being integrated with 'competency-based education' (CBE) in non-traditional higher education to serve the needs of employers who are seeking out student graduates (Camacho & Legare, 2016; Williams et al., 2015). Employers want student graduates who have mastery of general education competencies, critical thinking skills, and industry-specific competencies and skills (Williams et al., 2014).

Flexible Learning Content Consistent With Learning Objectives (P2)

Instructors must also create and design lesson content that promotes personalized learning and skills tailored to students with different learning aptitudes. Flexible content mediums must also be considered, including audio, video, and written text. Digital tools and platforms that teachers can use include podcasts for audio learners, YouTube for video learners, e-books for students who prefer text, iSpring® for PowerPoint users, and Nearpod for interactive lessons and gamification.

Promote Reflection and Collaboration (P3)

Students should be given frequent opportunities to reflect on what they are learning (Johns, 2018). Teachers should also evaluate their goals and their success at reaching their students, as a student should have the ability to make authentic choices and ownership over their learning.

Reflection can take many forms. These include questions, discussions, worksheets, simulations, and case studies for each DCS element. Online resources should be used whenever possible. Creating a learning community model for sharing student learning between the students, teachers, and parents is also suggested. Digital tools that can potentially support these goals and objectives include Line Groups and Facebook

Groups. Other information-sharing digital tools include chats, web boards, Google Drive, Dropbox, and Google Documents.

Assessing Learning Achievement so Learners Can Make Informed Decisions (P4)

Lastly, the LIIPPP Model suggests instructors create measurement tools that assess student learning achievement. Also, instructors need to collect data before, during, and after each session/module's use. Once again, educators could consider digital tools for this phase, including Google Forms, Adobe Captivate, Quizizz, Wordwall, Classtime, Formative, Liveworksheets, and Socrative. Therefore, these tools can allow both teachers and students to see the learning progress and thus decide how to improve, modify, or develop the curriculum.

The LIIPP Model Findings Overview

As discussed, the study on how to improve Thai student digital citizenship skills (DCS) through personalized learning techniques in an online, digitally based environment determined that there were five primary and four sub-elements needed. Moreover, the seven experts tasked with determining the importance of the elements felt that four of the seven components ranked equally in importance. These were 1) personalized learning, 2) setting the goals, learning needs, and interests of the students, 3) the platform used for online teaching and the access to underlying ICT infrastructure, and finally, 4) flexible learning content consistent with learning objectives (mean = 4.71, SD = .49).

Occupying the second tier in importance for the experts were the 1) learners, 2) instructors, 3) promotion of reflection and collaboration, and 4) assessing learning achievement so learners can make informed decisions (mean =4.57, SD = .53). Finally, the experts viewed the physical importance of the network connection as the least important of the seven items ranked (mean = 4.43, SD = .53).

Confirmation of these results was supported by other studies in which digital learning ecosystems were composed of four components: the learner, instructor, Internet, intranet, or extranet, and a platform for online teaching and support (Reyna, 2011; Tomadaki & Scott, 2006). Also similarly, usability and resource components are essential within the DLE (Jeladze et al., 2017). Moreover, ICT is highly advantageous in allowing accessibility to distance learning and tracking a student's progress (Norman, 2016).

The study was also consistent with other authors' determinations concerning the importance and use of personalized learning in an online environment. One reason for this is that learning can occur anytime and anywhere (Neo, Neo, & Yap, 2008). This is also consistent with the importance of flipped learning as a new paradigm in non-traditional online education (Noonoo, 2012).

These findings concerning a personalized learning model are also supported by Johns (2018), who indicated the need for achieving results, flexibility in the tools and content used, targeted instruction, student ownership and reflection, and lastly, decision making, which is data-driven for the model. Moreover, according to the LEAP Learning Framework, personalized learning should be focused on the learner who leads and demonstrates their essential real-world skills that are career-connected (LEAP Innovations, 2021).

This is consistent with Yu and Zheng (2018), who also indicated that personalized learning should support lifelong learning and be focused on competency-based learning. Also, Kingsley (2020) has stated that personalized learning is a crucial element in distance learning during the COVID-19 pandemic and the creation of safe digital ecosystems.

However, it must be noted that online education success is ultimately in the hands of the instructors. Therefore, there is an essential need for the up-skilling of their abilities to structure their online teaching and apply strong theoretical underpinnings when designing learning activities (Yee, 2015).

Digital Citizenship Skills (DCS)

Various global organizations and concerned scholars have delved into which aspects negatively and positively contribute to DCS. However, multiple studies have determined that student technology comfort use is not the same as using the Internet and technology appropriately (García-Umaña & Tirado-Morueta, 2018; Pimdee & Leekitchwatana, 2019; Purnama et al., 2021; Ruenphongphun et al., 2021). Fortunately,

good digital literacy education can help students in online risk identification (Helsper & Smahel, 2020), which positively affects a student's academic achievement and outcome (Yustika & Iswati, 2020).

Therefore, for these reasons, we believe that finding an effective, digitally based ecosystem model in support of Thai student DCS is essential to the student, the school, and the nation. There can be no doubt that adequate and appropriate use of the Internet fosters a student's emotional health and, later, their professional growth. If a personalized learning system is implemented early in a child's educational development, creative change happens, and lifelong learning will be enabled.

CONCLUSION

The study developed a digital citizenship skill teaching and learning model for use in online teaching by Thai teachers and educational institutions. Fortunately, we discovered the crucial importance of this concept from a wide range of global studies and reports used to develop the initial model. After input and model refinement from a panel of seven educational experts, five primary and four sub-elements were used in the final 'LIIPP Model.' The standards used in the evaluation were also determined, along with a descriptive statistics analysis of the experts' input from their five-level questionnaires.

During the DCS LIIPP Model development, we also found solid support for the study's use of personalized learning as an essential foundation in the model. Also, whether digital citizenship skills or appropriate Internet use behavior, numerous global studies state the importance of the concepts in developing healthy and productive students and, later, 21-st century adult knowledge workers.

Moreover, the LIIPP Model's importance grew as we better understood the dire situation in education from the ongoing COVID 19 pandemic. Also, with both foreign and Thai education's swift transition to a 'New Normal,' the need and use for online education and how to effectively teach its use are increasing quickly. In Thailand, this importance has been highlighted at the onset of the global pandemic by the Minister of Education (MoE), who views online education as a method to ensure student safety during the pandemic. He also stated the importance of Distance Learning Television in the New Normal, matching a key concept within personalized education precepts. Interestingly, in Thailand under the New Normal, starting as early as secondary grade students (grades 7-12), the current Thai MoE expects interaction between faculty and students to focus on two-way communications using various online digital platforms. Therefore, teachers must enhance their ICT skills and develop online assessment processes.

Finally, although most probably not received all positively, the Thai MoE has indicated the shift in how education budgets will be allocated. This shift entails the movement of funds from traditional classrooms and schools to create online courses using ICT and digital devices to enhance online learning effectiveness. Welcome to the new world of the New Normal!

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