

## Development and Challenges of Digital Citizenship Education: A Literature Review

Jailyn N. Puerto-Mar\*, Christian Leubert C. Milambiling, Erlene G. Umali, and  
Sherlyne A. Almonte-Acosta

SEAMEO Regional Center for Educational Innovation and Technology (Philippines)

\*Corresponding author, E-mail address: [jailyn@seameo-innotech.org](mailto:jailyn@seameo-innotech.org)

---

### ABSTRACT

Digital citizenship can be simply defined as the responsible act and ethical use of technology. It encompasses the rights, responsibilities, and behaviors that individuals should uphold when engaging in digital spaces and communities. This literature review provides a comprehensive overview of digital citizenship, including its definition, rationale, frameworks, implementation in schools, and associated challenges. Further, this paper also emphasizes the importance of addressing digital citizenship through effective leadership, policy support, and equitable access to technology. A desk analysis was conducted, wherein data were gathered from various sources (e.g., google scholar, UNESDOC, ScienceDirect, etc.) and analyzed through a deductive approach. Through the review, we found that technological advancement has imposed discussions and policy changes as to how schools promote and implement the use of technology for teaching and learning. Thus, the findings can help provide additional information to educators, policymakers, and other stakeholders in developing and implementing digital citizenship initiatives that empower individuals to navigate the digital landscape responsibly and ethically.

**Keywords:** Digital Citizenship, Digital Citizenship Competencies, Digital Kids Asia-Pacific (DKAP) Framework

### INTRODUCTION

In our rapidly evolving digital landscape, the concept of digital citizenship has gained significant importance. Ribble and Bailey (2011) defined digital citizenship as comprising the concepts of responsibility, rights, safety, and security. Further, according to the Council of Europe (2017), this definition denotes appropriate and responsible behavior toward the use of technology. Digital citizenship has emerged as a vital area of focus due to its profound impact on society, education, and the overall well-being of individuals. As technology continues to shape the way we connect, communicate, and access information, understanding and practicing responsible digital citizenship has become essential in our daily lives.

The development of digital citizenship education has been driven by the recognition that individuals, specifically young people, are in need of guidance and support in navigating the digital realm. Providing individuals with the necessary knowledge and skills to be responsible digital citizens

has become crucial in the educational sector as technology continues to advance. Digital citizenship education aims to empower individuals to make informed decisions, engage in respectful and ethical online behavior, protect their personal information, and contribute positively to the digital community.

However, the implementation of digital citizenship education is not without its challenges. One of the primary challenges is keeping up with the rapid pace of technological advancements. As modern technologies and digital platforms emerge, educators and policymakers must constantly adapt and update themselves to digital citizenship education in order to address the ever-changing digital landscape effectively.

While substantial research has been conducted on digital citizenship, it is important to critically examine the existing literature and identify research gaps that require further exploration. Recognizing these gaps is crucial for advancing knowledge in the field and informing future research endeavors and interventions.

This paper aims to provide a comprehensive overview of the literature on digital citizenship, offering valuable insights and recommendations for educators, policymakers, and researchers. It is hoped that this study will contribute to the ongoing efforts in promoting responsible and ethical digital citizenship and empowering individuals to navigate the digital world effectively.

## **METHODOLOGY**

The review presented here is a scaled-down version of what is presented in the Review of Related Literature of the study on “School Case Studies on promoting Digital Citizenship Competencies (DCC) among selected Southeast Asian Ministries of Education (MOE)” of SEAMEO Regional Center for Educational Innovation and Technology (SEAMEO INNOTECH). The study was conducted from year 2014-2022, hence, some of the references used came from an older time frame. Given the evolving nature of digital citizenship and the need to capture foundational research and conceptual framework, it was essential to consider the literature that has significantly influenced the field during the project's inception and subsequent years.

A desk analysis was employed in this paper to gather and analyze existing data and information from various sources (e.g., google scholar, UNESDOC: UNESCO digital library, ScienceDirect, etc.). This approach entails a systematic collection and analysis of data without the need for primary data collection methods. It further involved identifying relevant sources, collecting, and organizing data, conducting thematic analysis, and synthesizing the findings to address the research objectives. Moreover, by applying the deductive approach, this desk analysis allowed a rigorous examination of the literature by identifying patterns, trends, and insights which are aligned with the established theories and frameworks. Thus, it provided a clear framework for the study for organizing and analyzing the data collected.

## RESULTS AND DISCUSSION

### 1 Defining Digital Citizenship

The definitions of digital citizenship in this study were derived from a diverse range of perspectives. The inclusion of diverse definitions enabled a comprehensive exploration of the concept, facilitating a more holistic understanding of the various dimensions and nuances associated with digital citizenship.

There has been a rise in people's participation in online communities as supported by wide-ranging forms of internet connections and platforms. Few research studies defining digital citizenship are being conducted because of the varied proliferation of the Internet and citizens' engagement in online communities (Atif & Chou, 2018). However, regardless of the diverse working definition of digital citizenship presented by several organizations (e.g., UNESCO, DQ Institute, Canada's Centre for Digital and Media Literacy, Council of Europe, OECD, among others) a single and generally accepted definition is still not standardized. This only reflects the complexity of its definition that has been recognized by various researchers.

Research studies that defined the context of digital citizenship focused on the following themes: individual or learner's ability, manner of engagement or behavior toward digital technologies, data, other online users, online environment, and society in promoting social, communal, and political aims. Digital citizenship is also closely related to the following concepts: "Global Citizenship," "Global Competence," "Digital Competence," "Digital Literacy," and "Media and Information Literacy" (Canada's Centre for Digital and Media Literacy, Ferrari, Frau-Meigs & Hibbard, OECD, Parker & Frailon, UNESCO, and Vuorikari, et al., as cited in Council of Europe, 2017).

Likewise, the Digital Citizenship Policy Development Guide, Alberta Education (2012) states that digital citizenship serves as a foundation and cornerstone for democratic nations. It provides necessary support to guide rights and responsibilities for civic, political, and societal engagement. The definition of digital citizenship proliferates in the digital world, hence, it enabled the emergence of multi-cultural, global, highly focused, and long-tailed communities (Anderson, as cited in Alberta Education, 2012) which considers the individual rights and responsibilities of every citizen.

Relevant to the concern on the definition of digital citizenship, Ribble, Bailey, and Ross, (2004) redefined digital citizenship as the behavioral norms on the use of technology. In 2010, the role of the different stakeholders such as the teachers, technology leaders, and parents was incorporated in their definition (Ribble, 2010 as cited by Hollandsworth et al., 2011). They further expounded that, "it is a way to prepare students, children, and technology users for a society full of technology". In 2011, digital citizenship was defined as comprising the concepts of responsibility, rights, safety, and security (Ribble and Bailey, 2011). According to the Council of Europe (2017), this definition signifies appropriate and responsible behavior towards the use of technology.

Recognizing the need to concretize the definition of digital citizenship, Common Sense Media in 2012 has interpreted the education on digital citizenship into a curriculum on the following topics: internet safety, privacy and security, relationships and communication, cyberbullying, digital footprints, reputation, self-image and identity, information literacy, and creative credit and copyright

(Jones & Mitchell, 2016). Further, in 2016, Choi and eTwinning defined digital citizenship competencies (DCC) using different categories and pillars. Choi (2016) focuses on four major categories: ethics, media and information literacy, participation/engagement, and critical resistance. While eTwinning (2016) focused on the three main pillars: belonging, engagement, and protection. Both agreed that digital citizens use technology to actively engage in and with the digital society.

UNESCO through the Digital Kids Asia Pacific (DKAP) and DQ Institute provided a definition of digital citizenship that focuses on learners, ICT, relationship, and behavior. UNESCO (2019b) defined it as “as learners’ skills, effective use of technology, and appropriate behavior of learners and agencies, as it encompasses the capacity to leverage the opportunities afforded by the internet for growth in areas such as skills to use ICT, collaborative skills, civic engagement, creative production and respectful engagement with others, as well as the capacity to take appropriate steps to minimize and address threats.” While DQ Institute defined it as “learners’ skills and appropriate and effective use of technology (ICT), the ability to take control of digital use in responsible and effective ways and promotes digital citizenship in the following aspects: digital citizen identity, screen time management, digital footprint management, cyberbullying management, digital empathy, critical thinking, privacy management, and cyber security management.”

The context of digital citizenship differs from one perspective to another. However, despite its different definition, it aims to responsibly use technology to address the needs and wellness of ICT users.

## **2 Rationale for Developing Digital Citizenship Competencies**

The rationale for the promotion and/or development of digital citizenship of different countries varies from each other. These include international treaties, national and local laws and legislations, ministry policies, and school-level initiatives, among others. This section highlights the international treaties supporting ICT as well as national and regional policies promoting digital citizenship competencies.

### **2.1 Policies, Programs, and Treaties Supporting ICT and Promoting Digital Citizenship Competencies in Southeast Asia**

In September 2015, the United Nations declared the global Sustainable Development Goals (SDG) on a wide-reaching and people-centered set of universal transformative goals and targets. SDG 4 explicitly outlined the importance of ensuring inclusive and quality education and it encourages lifelong learning opportunities to all. The United Nations said that by 2020, the number of scholarships available for admissions to higher education in developing countries, small island developing countries, and African countries should be considerably expanded. This includes an increase in vocational training that would develop country performance in ICT, technology and engineering, and science.

The international treaties supporting ICT mainly focused on its integration in SDGs 4, 5, 9, and 17. It is crucial that ICT is supported with agreements to effectively achieve its purpose, mainly in education in order to provide an efficient and interesting teaching-learning system that is in line with digital society advancement.

On the other hand, interventions at the national and regional level were adopted to

address ICT concerns. UNESCO Bangkok (2015) cited national programs that foster digital citizenship from the Asia-Pacific region. A comprehensive approach was done to educate children, parents, teachers, and the public about digital citizenship through various resources, activities, school curriculum, and support mechanisms.

Through the support of the Korea Trust Fund (KFIT) and Japan Trust Fund (JFIT), technical assistance to ASEAN Member States who wish to implement competency-based teacher training reforms to promote the integration of ICT-pedagogy was provided by UNESCO Bangkok. This initiative guides member states in identifying and developing ICT capabilities of teachers that are aligned with their country's policy vision, goals, and education ICT master plan. Moreover, it showed that the necessities of the Asia-Pacific region are associated with the lack of consistency and coordination in national ICT education policies, thus, effective use of ICT is needed to improve teaching methods and student learning (UNESCO Bangkok, 2017).

UNESCO Bangkok (2015) noted that national policy directives provide huge momentum for large-scale implementation of interventions compared to smaller initiatives that are not backed up by corresponding policies. Program inclusion in the government agenda suggests the buy-in of policymakers and contributes to successful implementation at the school, community, or country levels. Therefore, it was recommended by UNESCO to secure support and commitment of government authorities in ensuring sustainability and the lasting impact of interventions.

Moreover, SEAMEO INNOTECH (2016) found that in Southeast Asia, initiatives that promote the successful integration of learners into 21st-century life are anchored on laws, education development plans, and curriculum frameworks. For several public schools in Southeast Asia, state policy is the thrust for integrating inquiry as a pedagogical approach. For instance, the governments of "Brunei Darussalam, Malaysia, Philippines, Singapore, Thailand, and Vietnam adapt their educational frameworks and overhauled their basic education curriculum to place a stronger emphasis on cultivating their learners' critical thinking skills, creativity and innovation, problem-solving abilities, communication skills, socio-cultural awareness and participation, and other life skills."

Several countries, such as the Philippines, Singapore, and Vietnam, have implemented policies and programs to address cybersafety, protection issues, and the development of ICT competencies among teachers. These efforts aim to cultivate critical thinking skills, creativity, problem-solving abilities, and other life skills essential for learners in the digital age.

In the Philippines, UNESCO Bangkok (2015) found that the country has a strong policy-enabling environment on tackling cybersafety and protection issues in schools that is founded on the core messages of the UN Convention on the Rights of the Child. The Anti-Bullying Act of 2013, Special Protection of Children Against Abuse, Exploitation and Discrimination Act, Child Protection Policy of 2012, the Implementing Rules and Regulations for the Anti-Bullying Act, and Cybercrime Prevention Act of 2012 support the Department of Education's (DepEd) programs on cybersafety and wellness (UNESCO Bangkok, 2015). DepEd also instituted ICT-related policies that include "Guidelines in

Managing the Proper Use of Internet Services”, “Guidelines on the Proper Use of Computer and Network Facilities”, and “Computer Usage Code-of-Conduct Contract” (UNESCO Bangkok, 2015).

Further, SEAMEO INNOTECH, in partnership with the Alternative Learning System (ALS) of DepEd and UNICEF Philippines had completed the development of a Learning Action Cell (LAC) resources which was specifically designed for ALS teachers focusing on digital citizenship. The “LAC Resource Package on Mobile Technology for Teachers (MT4T) and Its Digital Citizenship Resources” was developed through the project on the Technical Support to DepEd Alternative Learning System 2.0 (TS-ALS 2.0).

The Philippine national government also developed an ICT stream in the teacher education curriculum that was anchored on the National ICT Competency Standards for Teachers. This created the pre-service teacher education program with two technology courses (Technology for Teaching and Learning 1 (TTL1) and Technology for Teaching and Learning 2 (TTL2). Two national workshops were conducted for basic trainers based on the pre-service TTL course. The Commission on Higher Education (CHED), through UNESCO Bangkok’s project on “Supporting Competency-Based Teacher Training Reforms to Facilitate ICT-Pedagogy Integration”, drafted a sample syllabus on Technology for TTL1 and TTL2 for pre-service teachers. SEAMEO INNOTECH facilitated the completion of the agenda of these courses.

In Singapore, the Inter-Ministry Cyber Wellness Steering Committee (ICSC) was established in 2009 which was composed of representatives from the Ministry of Communications and Information (MCI), Ministry of Education (MOE), Ministry of Social and Family Development (MSF), Ministry of Defense (MINDEF), Ministry of Home Affairs (MHA), Infocomm Development Authority of Singapore (IDA), Media Development Authority (MDA), Health Promotion Board (HPB), and National Library Board (NLB). Its purpose is to coordinate the government’s efforts and partnerships with various organizations in the implementation of a national strategy for Cyber Wellness public education (UNESCO Bangkok, 2015). The Cyber Wellness Program aims to help Internet users understand and practice appropriate online behavior as well as take responsibility for and self-manage their well-being and protection in cyberspace. The Cyber Wellness Student Ambassador Programme (CWSAP), as a multi-stakeholder collaboration among the MOE, IDA, and Microsoft SG, was launched in 2009.

Singapore’s Media Development Authority (MDA), the regulatory body for media providers, requires Internet Service Providers (ISPs) to actively promote Internet filters at the point of sale or renewal of residential broadband subscriptions. It requests media providers to develop socially responsible apps and contribute to Cyber Wellness efforts through their respective outreach programs (UNESCO Bangkok, 2015).

Singapore’s Ministry of Education (MOE) uses the Sense-Think-Act framework that is guided by the principles of “respect for self and others” and “safe and responsible use.” This framework guides the Cyber Wellness curriculum that is implemented in schools. The MOE set up a portal to provide parents with tips and resources on safeguarding children’s online experience and selecting age-appropriate content (UNESCO Bangkok, 2015).



In Vietnam, two policy studies were conducted to assess the ICT implementation in the schools. First is the study by Peeraer & Tran's (n.d.) on Vietnam's mission and vision in integrating ICT education entitled "Integration of ICT in Education in Vietnam: from Policy to Practice." The second is by Peeraer, Mai Thy, and Thai Ha (n.d.) policy analysis entitled "Policy Analysis Integration of ICT in Education in Vietnam: Translation and Implementation in Teacher Education." These policies outlined and investigated several policies (state and ministry levels) that contributed to and framed digital citizenship education in Vietnam.

The Vietnamese government adopted ICT integration as a national strategy to respond to the demand of the global knowledge society for qualified human resources (Peeraer et al., n.d.), which is similar to the strategy of Singapore. Specifically, the strategy focused on ICT skills training and development of ICT infrastructure to enhance industrialization and modernization.

Vietnam's Master Plan for ICT in Education (2001-2005) was launched by Vietnam's Ministry of Education and Training (MOET) in 2000. Vietnam's Prime Minister introduced concepts like 'e-Vietnam', 'e-Government' and 'e-Citizenship' (Phan, as cited in Peeraer et al., n.d.), that intended to develop an information society. Moreover, Vietnam's Year of ICT (2008-2009) was recognized as a strategy that aimed to further develop the awareness of the role and position of ICT in education and integrate ICT in the activity plans of different organizations in society (MOET, as cited in Peeraer et al., n.d.).

### **3 Digital Citizenship Framework**

This section discusses the DQ global standards, measuring DCC, and the DKAP framework. The UNESCO Digital Kids Asia-Pacific (DKAP) Framework was further highlighted featuring the five domains namely: Digital Literacy Domain, Digital Safety and Resilience Domain, Digital Participation and Agency Domain, Digital Emotional Intelligence Domain, and Digital Creativity and Innovation Domain.

#### **3.1 DQ Global Standards**

Digital Intelligence (DQ) is defined a thorough set of technical, cognitive, meta-cognitive, and socio-emotional competencies universally established in moral values that allow individuals to deal with the challenges of digital life and adapt to its demands (Park, 2019).

According to the DQ Global Standards Report (2019), the DQ Framework is a systematical structured holistic set of digital competencies as a reference framework. Further, the goal of institutionalizing the DQ Framework as a global standard is the advancement of a common understanding, structure, and taxonomy for digital literacy, skills, and readiness that will enable individuals, organizations, national ministries, and technology developers to communicate in the formulation of essential digital competencies effectively and systematically.

#### **3.2 Measuring Digital Citizenship Competencies**

Ribble (2011) presented nine elements of digital citizenship focusing on technology

leaders and teachers. These elements show how technology influences the way people interact and the concept of digital citizenship in the classroom. As cited by Lauricella et al., (2020), the nine components are the following: 1.) digital access; 2.) digital commerce; 3.) digital communication; 4.) digital literacy; 5.) digital etiquette; 6.) laws and regulations related to digital use; 7.) digital rights and responsibilities; 8.) digital health; and 9.) digital security. The major limitation of these components is that there are some elements beyond the scope of individual student responsibilities (i.e., rights, communication, education, and access).

Further, Choi, Glassman, and Cristol (2017) developed a five digital citizenship scale for adults by studying graduate students and university students. The scale comprises the following: Technical Skills, Local/Global Awareness, Networking Agency, Internet Political Activism, and Critical Perspective. It is limited to the participation of adults on the Internet-centric community.

On the other hand, according to Gleason and Gillern (2018), digital citizenship is obtained by combining these theoretical points, but they also showed that they have made a unique contribution to the field. They proposed a student-centered (e.g., teacher-led) model of digital citizenship, emphasizing participation through strategic creation, planning, and dissemination (e.g., rather than passively acquiring information), and based on real youth socio-cultural practices (for example, rather than the normative use of technology) (Gleason & Gillern, 2018).

### **3.3 Digital Kids Asia-Pacific (DKAP) Framework**

The DKAP Framework was established to become an evidence-based foundation on children's knowledge, behavior, and attitudes toward ICT. It specifically aims to guide interventions on children's digital citizenship. The framework was recommended as part of UNESCO's attempt to enhance the national capacity to foster digital citizenship education across Asia and Pacific. The framework recognizes the digital competency of students across the Asia Pacific region (Le Vinh et al., 2019).

It was also used as the basis of a survey that intended to focus not only on identifying the ICT level including the cognitive and non-cognitive skills of the students, but also on incorporating an extensive assessment of the association between demographic, cognitive, behavioral, sociocultural and contextual factors, and the digital competencies of the students (Le Vinh et al., 2019). DKAP seeks to achieve a comparative cross-national study to address the knowledge gap in the Asia-Pacific region concerning children's ICT practices, attitudes, behaviors, and competency levels within an educational context (Le Vinh et al., 2019).

DKAP objectives (as cited by Le Vinh et al., 2019) are to contribute to the evidence-based understanding of digital citizenship competencies of children in Asia-Pacific by obtaining and comparatively analyzing quantitative and qualitative data on children's actual attitudes, behaviors, competency levels, and use of ICT within an educational context and to gain evidence-based insights into children's safe, effective, and responsible use of ICT in Asia-Pacific by developing and validating a framework that can measure children's attitudes and behaviors, competency levels, and use of ICT within an educational context.



The DKAP framework is composed of five digital citizenship domains which are the following:

a. Digital Literacy Domain

Digital Literacy is the ability to seek, critically evaluate and effectively use digital tools and information to make informed decisions. It is associated with the effective use of digital tools and information in the cognitive domain. It is composed of two competencies: 1.) ICT Literacy; and 2.) Information Literacy.

b. Digital Safety and Resilience Domain

Digital Safety and Resilience relate to the ability of young people to protect themselves and others from harm in digital space. Due to the vulnerability of K-12 learners in digital space, various organizations have suggested numerous competencies related to using ICTs safely.

c. Digital Participation and Agency Domain

Digital Participation and Agency is the ability to equitably interact, participate and influence society positively through ICT. It addresses sharing information with others, cooperating, and participating in ICT-based activity for positive local and global outcomes, and netiquette-based interaction.

d. Digital Emotional Intelligence Domain

Digital Emotional Intelligence is the ability to identify, navigate, and express emotions in intrapersonal and interpersonal digital interactions. It relates to using digital tools and resources in the socio-emotional domain. Problems caused by anonymity can be more easily encountered in digital space, which is also characterized by a lack of good quality visual and verbal cues. Thus, this domain becomes more crucial, as it is not only about emotional self-control in digital space, but it relates to the emotional awareness of others and the ability to apply emotional expression.

e. Digital Creativity and Innovation Domain

Digital Creativity and Innovation is defined as the ability of a child to express and explore himself or herself through the creation of content using ICT tools. It is related to the use of digital tools and resources, especially in the production of tangible products and self-expression online. The acquisition of knowledge is vital, but it is also crucial because digital citizens can express themselves based on the acquired knowledge and information in solving problems and supporting change. In digital terms, this domain highlights the capacity of a child to generate positive outcomes based on digital literacy.

Through the DKAP Framework, different stakeholders in the education sector are given the opportunity to work together to bridge the knowledge gap in the Asia-Pacific region and create a safer, more inclusive, and empowering digital environment for children. The framework specifically helps children to become responsibly empowered digital citizens

equipped with the knowledge and skills that are essential in a technology-driven world.

### 3.4 Promoting Digital Citizenship in Schools

With the recent emergence of the concept of educational technology (EdTech), several educational institutions are now allowing students to bring their digital devices to school, with the belief that it will incorporate more technology in the classroom. It is essential that both teachers and students examine the consequences of their online activity regardless of its ethical value (Suson, 2019). However, if digital citizenship is going to be a new educational focus of the schools, a significant amount of conceptual and evaluation work is necessary to ensure that learning objectives and indicators are well-defined, and its outcomes are attainable and measurable (Jones & Mitchell, 2016). As previously mentioned, the importance of digital citizenship within educational institutions cannot be nullified. Through its programs and curriculum, it is necessary for students to acquire competencies in digital citizenship in schools. They need to adapt to the complex and ever-changing technologies (Ata & Yildirim, 2019).

As of the current, the global COVID-19 pandemic presupposed that people across the globe practice social or physical distancing to be able to manage and lessen the spread of the virus. School administrators and teachers who were not well-versed in technology were unexpectedly required to change their learning delivery remotely or online. Suddenly, they were faced with several teaching, learning, and technological issues that made problems of equity in education and access more apparent than ever (Buchholz, DeHart, and Moorman, 2020). Buchholz et al. (2020) added that in this COVID-19 pandemic context, the move to online platforms in 2020 is “not homeschooling...not distance learning...not online schooling” (Hughes & Jones, 2020) but instead “COVID-19 Schooling.” They added that from this standpoint, these online educational experiences can be viewed as a form of crisis management that has its own unique context, approaches, issues, and concerns. Similarly, Fernández-Prados, Lozano-Díaz, and Ainz-Galende (2021), Buchholz et al. (2020) also believe that this situation provides an opportunity to re-create and reimagine a more expansive and experiential view of the critical literacy practices necessitated for digital citizenship in the post-COVID-19 world.

Moreover, according to Hollandsworth, Dowdy, and Donovan (2011), awareness, education, and programs are essential to give students the basic knowledge and a code of conduct to guide them in this digital society. Likewise, it is not considered appropriate to send children into traditional society without teaching them the basic concepts of legal, ethical, and moral conduct. It is important for children to learn these concepts beforehand so that it would serve as a foundation to truly understand the traditional ways of society.

Digital citizenship also supplements several ideas of media literacy which highlight the role and responsibilities of the users such as the youth (Lauricella et al., 2020; Ribble, 2017). With this, it is necessary to consider redirecting education on digital citizenship of the youth to be incompatible with the usual digital literacy education such as cyberbullying prevention. Digital citizenship should mainly focus on practicing the proper use of internet resources with respect and resilience and utilizing all readily available internet resources to increase sensible online participation (Kim & Choi, 2018; Jones & Mitchell, 2016).

#### 4 Digital Citizenship and Governance

In this section, different studies on digital leadership and governance were reviewed. The role of school heads and other school leaders in promoting the teaching of DCC in schools is also discussed.

According to Tiekam (2019), digital transformation is impossible without the presence of a leader who creates a stage for digital transformation and drives stakeholders to achieve this goal. Sainger (2018), as cited by Tiekam (2019), emphasized that the leader deliberates on the relevant technologies needed to drive continued business success. This is one of the reasons why digital leadership is one of the solutions in the fast-changing digital era (Damayanti & Mirfani, 2021). School leaders must understand how to use various technologies and tools in the digital world and understand their impact on relationships with various stakeholders, otherwise, they will be left behind in this digital age (Tiekam, 2019).

In the context of this study, the definition of digital leadership is the integration of digital technologies (such as mobile devices, communication applications, and web applications) in the leadership practices of school leaders to achieve sustainable changes in the use of school technology. As mentioned by Goethals et al. (2002), as cited by Yücebalkan (2018), there are two related, but distinct categories of leadership called “leadership in the digital era” and “digital leadership”; leadership in the digital era indicates the leadership position of a company or department in the process of diffusion to an information-intensive society while “digital leadership” refers to leadership in the core sectors of the information society, such as communications, news, or multimedia (Yücebalkan, 2018; Goethals et al., 2002:2).

In schools, digital leaders are people who can use technology and digitalization and consider the latest changes such as ubiquitous connectivity, open-source technology, mobile devices, and personalization, which represent great changes in the school structure for more than a century (Damayanti & Mirfani, 2021). School leaders are also expected to learn to predict the learning needs of students and faculty, their desire for stakeholder input, and elements of school culture necessary for common standards and core skills (Agustina et al., 2020). Lastly, leaders must understand change (Borowska, 2019).

##### 4.1 Need for Leadership and Governance

This global phenomenon of digitalization has prompted academics to introduce several new terms, including remote leadership, digital leadership, virtual leadership, and e-leadership, which also challenged the leadership style of school leaders (Yusof et al., 2019).

Educational leadership, especially the impact of digital leadership on educational supervision, is a key theme in modern curriculum design. It is recognized that the reality of teaching and education leadership in the 21st century is that only when a variety of technological methods are used in the following circumstances can all teachers, students, and stakeholders in this field participate in education better and more effectively (Aldawood et al., 2019).

School administrators, for example, indicated that their role had changed “from leading a group of teachers whose primary role is to deliver knowledge toward leading a

group of teacher facilitators of learning” (Lindqvist & Pettersson, 2019; Chua Reyes, 2015). Educators at all levels are beginning to realize that the technological revolution has caused them to reassess the policies and procedures within their organizations. There is also an increased reliance on digital platforms such as social media for engagement at the school and external community levels (Aldawood et al., 2019). Social media platforms such as Facebook and Twitter were created as tools for social communication and are now used to share information within and between classrooms. With the interference of these types of online classrooms, the line between how this platform is used for social and educational purposes becomes blurred (Ribble & Miller, 2013).

Technology and infrastructure are essential, but technical leadership is also necessary for the effective use of technology in schools (Agustina et al., 2020). According to Ribble and Miller (2013), school leaders must become aware and begin addressing these necessary changes when it comes to technological programs and policies for their students if the major thrust of education is to prepare children to become responsible adults.

The presence of effective leaders who know, understand, and embrace digital technologies is crucial for driving sustainable changes and achieving success in the digital era. Hence, by embracing digital leadership, school leaders can effectively harness the potential of technology, foster innovation, and ensure the development of a digitally inclusive and competent school community.

#### **4.2 Indicators of Digital Leadership**

There is no clear description of the indicators that can be used to represent successful digital leadership (Zhong, 2017). Zhong (2017) cites the view of García (2014), who believes that digital leadership is associated with familiarity with technology, use of information retrieval, communication with stakeholders, and management of resources. Unfortunately, these categories did not incorporate all the indicators, such as digital citizenship.

School leadership is closely related to the teaching and use of school technology. School leaders in ICT are extremely important for teachers to implement and innovate ICT in the classroom set-up (Ottestad, 2013; Kirkland & Sutch, 2009; Kozma, 2003). They are also critical in educating students with digital skills by promoting the necessary infrastructure and a good working environment, as well as a clear ICT teaching plan and vision (Ottestad, 2013; Dexter 2008).

From the standpoint of the school head's role, school leaders are characterized by assigning formal roles and legitimacy; allocate leadership responsibilities to teams and individuals; and closely monitor and discuss the teaching needs and practices of teachers. However, it must be emphasized that the school's teaching leadership should be understood as "the interaction of the influence of the principal and the teacher" (Ottestad, 2013; Jackson & Marriott, 2012). When using ICT in daily teaching practice, the role of school leaders is subject to additional requirements because they need to carry out ICT-related professional development activities to support their new role as technology leaders (Ottestad, 2013; Stuart et al., 2009).

Deschamps (2005), as cited by Borowska (2019), mentioned six characteristics of

successful innovation leaders: 1.) They combine creativity with process discipline from the start to the end of a project; 2.) They have the courage to start projects and stop them when they do not work out well; 3.) They are aware of and accept that failure, risk, and uncertainty are part of a project; 4.) They are open to new ideas and technologies that lead to experimentation; 5.) Leaders have a passion for innovation and commitment which they share with employees; and 6.) They have a talent for creating innovative teams and motivating employees, even in difficult times.

Promsuwan et al., (2019) mentioned seven indicators for digital leadership. For them, digital leadership means actions or behavior that reflect digital learning for potential building within a team, namely, 1.) communication, 2.) public relations, 3.) branding, 4.) student engagement and learning, 5.) professional growth and development, 6.) Re-envisioning learning spaces and environment, and 7.) opportunity (Promsuwan et al., 2019; Sheninger, 2014).

According to Khan, the leadership skills required for success in today's conditions can be listed as (Yücebalkan, 2018; Khan, 2016): creating a transformative digital vision; mobilizing the employees by participation; focusing on digital governance; and focusing on technology leadership. Fragouli and Ibidapo (2015) pointed out that in a crisis, it is vital to have leaders who do not rely on hierarchy or subordinate status, and these leaders are interested in formulating and implementing meaningful leadership strategies, so they can update the organization effectively during a crisis (Murashkin & Tyrväinen, 2020). Therefore, in such a vast online world where educational technology has developed, it can be said that digital leadership is required in this virtual environment and pandemic environment (Damayanti & Mirfani, 2021).

Considering the fundamental nature of the changes that digital leadership is leading in the field of education, it is a bold form of leadership. Not only can digital leadership inspire educational change, but it can also encourage students, teachers, and all other stakeholders to participate in the change (Aldawood et al., 2019).

In the rapidly evolving digital environments, digital leadership becomes essential in effectively navigating the virtual world of education. Through digital leadership, educational institutions can drive educational transformation and aid the active participation of various stakeholders in the process of embracing digital citizenship.

### **4.3 Role of Digital Leaders in Promoting Digital Citizenship**

In this section, the role of digital leaders in promoting digital citizenship in terms of school direction setting and planning, instructional leadership, technology leadership, resource mobilization, and school-community partnership, was discussed.

#### **4.3.1 School Direction Setting and Planning**

Studies by the Council of Europe (2017) and Ottestad (2013) showed that some of the school head's responsibilities in terms of setting directions/planning include establishing policies at the school level and planning for the pedagogical use of ICT. However, Bryderup and Kowalski, as cited in Peeraer, et al. (n.d.), cited challenges to the school head's school

direction setting and planning function and found that operational planning is a balancing act between technical and pedagogical issues and support activities; and a gap between this rhetoric and educational practice remains, although awareness on potentials for improved quality of education is high.

As stated by Ottestad (2013), school leadership indicators for ICT (e.g., digital practice, ICT maturity, evaluation, and the role of ICT use and collaborative leadership) can be a tool to analyze the schools to prepare to use ICT in accordance with national policies and research, leadership, and the school director's vision for the use of ICT in teaching is achieved through their influence on the support and technical infrastructure.

The importance of school direction setting and planning lies in providing a clear roadmap for the integration of ICT in education. By creating and implementing educational policies, aligning with national guidelines, addressing challenges, and providing support, school leaders create an environment that promotes the effective use of ICT and enhances the quality of education.

#### **4.3.2 Instructional Leadership**

Studies by Qureshi (2013) revealed that instructional leadership can be viewed in terms of narrow and broad concepts; there are necessary traits for school heads to promote instructional leadership; school heads influence teachers on the use of limited resources for ICT; consultative and collaborative work environment is important; and that incorporating ICT into teachers' pedagogy is challenging.

Qureshi (2013) identified the impact of leadership strategies on the meaningful use of ICT in schools and found that: the level of support that teachers receive from their school administrators is a key factor in their integration of technology in the classroom (Sandhotz et al., as cited in Qureshi, 2013). Furthermore, school heads who regarded ICT as an important factor in students' learning have schools that stand out or are noticeable (Schiller, as cited in Qureshi, 2013).

Instructional leadership is crucial in the promotion of the significant use of ICT in schools. By providing support, prioritizing ICT integration, and fostering a collaborative work environment, school leaders can enable teachers to effectively use technology in their teaching practices which can further lead to enhancing student learning outcomes.

#### **4.3.3 Technology Leadership**

Ottestad (2013) pointed out that school leadership skills are associated with the use of computers for teaching, planning, and administration and school heads have a crucial role in developing school-wide ICT innovations in school. School's ICT leadership indicators (i.e., digital practice, ICT maturity, evaluation and role of ICT use, and collaborative leadership) seem to be related to the following: 1.) use of computers by teachers for teaching and higher levels of planning; 2.) teachers' use of email, presentations, and learning management system (LMS) software; 3.) teachers' attitudes towards innovative and student-centered pedagogy; and 4.) construction of the ICT lifelong learning pedagogy.



ADB (2018) found that a challenge to school heads' technology leadership is a lack of training in using technology. In addition, the school head and other schools' administrative staff only receive project-led, short-term training, although they are expected to submit Education Management Information Systems (EMIS) data electronically.

Technology leadership is essential in harnessing the potential of technology in education. School leaders who exhibit strong technology leadership skills can drive ICT innovations, support teachers' adoption of technology, foster a culture of innovation and collaboration, and promote effective use of technology for teaching, planning, and administration.

#### **4.3.4 Resource Mobilization**

ADB (2018) and Fredriksen (2014) recognized varied means to mobilize support for e-learning initiatives (e.g. some governments support ICT by providing ICT infrastructure to locales or subsidizing enterprises); that school heads need strong managerial skills to mobilize support for ICT programs; that schools' capacity to mobilize resources is an important institutional constraint in most countries; that increased collaboration between public and private sectors could strengthen sustainability and local support for initiating ICT programs; and knowledge and innovation drives change in education priorities and policies.

ADB (2018) found that strong managerial skills to mobilize local support are required for successful ICT-enabled teaching and learning programs and to develop teachers for both the pre- and in-service training on ICT. Increasing collaboration between community groups and public sector stakeholders may strengthen domestic buy-in to initiate and sustain e-learning initiatives; and mobilizing community support to drive e-learning initiatives is increasingly done through local fundraising, corporate social responsibility, and alumni networks, as many schools in the Pacific are managed by community groups.

Fredriksen (2014) identified challenges in mobilizing resources for ICT and cited instances where people in low-income/unemployed groups do not see the need to own a computer or access the Internet. Fredriksen (2014) found that lengthy, high-level aid dependency has a potentially harmful long-term effect as it has the likelihood to distort national administrative and budget processes and cause a slowdown in efforts to create a sustainable system for domestic resource mobilization.

Resource mobilization is vital for the successful implementation of digital citizenship education. By successfully mobilizing resources, schools can provide learners with the essential tools, knowledge, and skills in order to become responsible digital citizens in the digital society.

#### **4.3.5 School-Community Partnership**

In the context of school-community partnership and stakeholder management, studies by UNESCO (2019a), James, Weinstein, and Mendoza (2019), Council of Europe (2017), and UNESCO Bangkok (2014) found that learners learn, seek help, and receive advice on ways to use the Internet from a variety of people that include parents or caregivers, teachers, siblings, and peers.

James et al. (2019) found that parents seek teachers' advice on guiding their kids' use of digital media. However, there is no one-size-fits-all approach to engaging parents as each parent population is unique. The Council of Europe's (2017) discussion paper entitled "Digital Citizenship Education: Working Conference" found that school stakeholders include students, parents, teachers, school management, academia, the private sector, civil society, local educating committees, regulatory authorities (data protection authorities), and national/international authorities.

UNESCO Bangkok (2014) found that various programs encourage parents and caregivers to promote good values by being good role models and using life incidents as teachable moments. They also added the need for parents/caregivers to establish a trusting relationship with children, monitor their computer use, and impose a healthy balance of controls and mediation.

Moreover, James et al. (2019) found that parents' lack of understanding or appreciation of the learners' experiences on social media or gaming platforms discourages learners from seeking support and guidance from their parents; and parental modeling and habits on how they manage their own digital devices (i.e., distracted driving, always being on their devices and not paying attention to them) affect and frustrate learners.

School-community partnership is instrumental in promoting digital citizenship among learners. Collaborating with parents, teachers, and various stakeholders in the education sector allows for a comprehensive approach to educating students about responsible and ethical digital behavior. By involving parents, addressing learners' digital concerns, and providing guidance, schools can empower learners to navigate the digital world safely and responsibly.

## **5 Issues and Challenges in Digital Citizenship**

Issues and challenges are usually encountered in the context of digital citizenship and these concerns have various implications for the stakeholders. Societies in different levels and contexts of development must contend with a myriad of issues when utilizing ICT such as social, ethical, safety, security, and health and mental issues (Beurkens, 2017; Livingstone, et al., 2017; UNESCO Bangkok, 2014; UNICEF, 2011, 2017; WHO, 2011). In Southeast Asia, issues on quality, equity, and efficiency in education need to be recognized to maximize the benefits of ICT (The HEAD Foundation, 2017).

Various challenges were found when analyzing ICT and its place in different societies. There are challenges with the use of the Internet, digital technologies, and what is available online. In addition, there is a lack of research and comparability of data and the digital divide (countries, children, and gender gaps). Recently, media in the US mentioned that there is an increasing proof in the abuse and misuse of technology in the schools. It includes using the online web to intimidate or frighten students, making illegal downloads on the internet, plagiarizing, and using mobile phones during class to play online games (Ribble et al., 2004).

Digital citizenship encompasses a variety of behaviors with various levels of risk and possible negative implications when it comes to usage and online activities. Without knowledge or even awareness of digital citizenship education can lead to problems, confusion, and even danger in terms

of student conduct. Based on existing literature on digital citizenship, the following issues and challenges surrounding digital citizenship education were identified.

### 5.1 Digital divide

Digital inequalities within and across countries, socioeconomic status, geography, gender, age, physical abilities, and educational background also persist (International Telecommunication Union or ITU and Broadband Commission, as cited in UNESCO, 2019a). In terms of geographical location, UNESCO (2019a) found that in general, learners from urban schools have higher digital competencies across five domains (Digital Literacy, Digital Safety and Resilience, Digital Participation and Agency, Digital Emotional Intelligence, and Digital Creativity and Innovation) compared to learners from rural areas.

“Digital access,” or the digital divide, is one of the main concerns of media and information literacy (e.g., Moeller et al., 2011; Mossberger, 2009; Mossberger et al., 2008; Ribble, 2004, 2009; Ribble & Bailey, 2007). There is a huge gap between people who have easy, reliable Internet access and those who have limited or no Internet access (Choi, 2016; Mossberger, 2009; Mossberger et al., 2008; Shelley et al., 2004). Race, ethnicity, age, and educational levels are considered significant predictors of Internet access (Choi, 2016; Shelley et al., 2004).

UNESCO (2019a) found severe digital divides between and within the countries that significantly affect children’s competency levels of almost all digital citizenship domains with some learner-respondents in participating countries such as Bangladesh (40.0%) and Fiji (32.0%) that “have never used any digital devices or used less than a year” compared to Korea (3.0%) and Vietnam (7.0%). They also pointed out that in the context of the United States, learners are more vulnerable to inadequate information and situations delivered by the Internet compared to adults (Hollandsworth et al., 2011) and children’s access and quality of use of ICT is affected by socioeconomic status (Gasser and Palfrey, 2007). Moreover, ITU and Antonio & Tuffley (2014) found that there is often a gender gap in combination with other indicators of marginalization. UNESCO (2019a) also established that girls, in general, have more holistic digital citizenship competencies and outperformed boys in all five aforementioned domains. However, females are often underrepresented in STEM areas and only account for at most 18% of the STEM workforce in Japan (15.0%) and Korea (18.0%).

Further, the digital divide between the public and private schools is more evident if we examine digital citizenship competencies. In most public schools, digital citizenship is not widely taught, which makes the students learn online literacy on their own (Gleason & Gillern, 2018). These middle school students are more vulnerable because of the lack of awareness of digital education. They also usually perform lower than high school students on web search behavior tests (Martin et al., 2020). In the Philippines, female Grade 12 students in School Year 2017-2018 who were enrolled in the STEM Strand only accounted for 45.0% of STEM enrollees (Philippine Institute for Developmental Studies, 2018). Moreover, World Bank, as cited in UNESCO (2019), stated that for women, lack of Internet access is connected to factors such as low education levels and living in remote areas.

Trilling and Fadel (2009) and Kivunja (2014) believed that an educated person needs

to have skills for independent and efficient problem-solving and logical thinking (Walters, Gee, and Mohammed, 2019). In addition, the activities that people can do with computers and the Internet have increased ethical dilemmas and raised current issues and moral choices that do not exist in the previous computer generation world (Walters et al., 2019; Rice et al., 2015). One indispensable issue is that students in middle school are misusing social media because they lack the skills and knowledge on how to prevent and avoid digital footprints that may incur security threats (Snyder, 2016).

Moreover, the digital divide among students and teachers is manifested in terms of the availability of software and hardware tools, access to online materials especially during the pandemic, school policies, curriculum integration of digital citizenship, and teacher training on educational technology.

There are few policies and very limited resources to increase the number of trainings of the pre-service teachers and in-service teachers on educational technology and most importantly on ways to teach the competencies of digital citizenship (Lauricella et al., 2020; Livingstone et al., 2011; U.S. Department of Education, 2017). Given the presence of digital divide, there is a need to focus on teacher training plans and initiatives.

## **5.2 Challenges in Implementing Policies on Digital Citizenship**

Digital citizenship is also experiencing issues and challenges when it comes to policy formulation, monitoring, and evaluation. ADB's (2018) study entitled "ICT for Better Education in the Pacific" stated that key policy barriers to overcome in the implementation of ICT for education include limited coordination between ministries of education and other line ministries. The lack of capacity to map and respond to the key education sector hinders the large-scale uptake of ICT4E (ICT for education) in the Pacific region. Other barriers include national ICT4E policies that are narrow in scope (i.e., focus on teaching ICT as a subject, as opposed to using it as a tool to support teaching and learning); misaligned with local context or broader ICT sector policies due to development of ICT4E policies before reforms to the telecommunication sector in many Pacific countries were implemented, or are overly ambitious.

On the other hand, UNESCO Institute of Statistics (2014) identified reasons why policies on integrating ICT in education might fail. These include policies that are viewed as symbolic gestures; teachers actively resist policy-based change due to a perception of policy imposition from the outside (Tyack and Cuban, as cited in UNESCO-UIS, 2014); policy's lack of explicit connections to instructional practice (e.g., focus on hardware) rather than their relationship to pedagogy; lack of opportunities provided to teachers to learn the policies and their instructional implications; and lack of program and resource alignment to the policies' intentions (Cohen and Hill, as cited in UNESCO-UIS, 2014).

Peeraer et al. (n.d.) found that, in the context of Vietnam, multiple rationales, unclear definitions, less comprehensible technology plans, and vague standards posed challenges to policies on digital citizenship. Among Vietnam's Teacher Education Institutions (TEIs), approaches to integrate ICT into education practice and multiple rationales lead to a lack of clear direction and purpose. Multiple characteristics of and delays in policy guidelines

and implementation led to actions that aimed at more technical issues in ICT skills training. Even MOET's Directive 40 lacked a clear definition of what an e-lesson is and had vague standards for indicators of integration of ICT. Additionally, some TEIs also had less comprehensible technology plans for future teachers.

In order to address these challenges, there should be increased collaboration and coordination between relevant ministries and educational stakeholders to ensure coherent and aligned policies, and provision of professional development programs for teachers, focusing not only on ICT skills but also on the instructional implications of digital citizenship policies.

### **5.3 Limited Research and Training to Improve Teacher Preparation**

Challenges that were identified on how teachers are prepared to teach digital citizenship competencies in pre-service and in-service training (continuing education) include the limited/lack of research on teacher preparation for ICT education as to how they are trained and how to develop teachers' professional competency. Similarly, UNESCO-UIS (2014), found that there is limited/lack of research on the required teacher training, its frequency, appropriateness and affordable types of training, and coverage, in the context of creating a motivated teaching workforce in using ICT in the classroom, curricula, and pedagogies. ADB, as cited by UNESCO-UIS (2014), found that teachers and their unions frequently resist the integration of ICT into education. This scenario usually exists in countries with an aging population, underpaid teachers, and inadequate teacher training and preparation.

On the other hand, ADB (2018) found that training programs in teacher education institutions do not typically include e-learning competencies resulting in teachers who are not trained to use e-learning resources in their classroom practices. In in-service training or continuing professional development, ADB identified that most ICT training for teachers is provided through short, in-service programs and teacher training. Moreover, pre-service teacher training programs in the Pacific region provide limited to no ICT exposure, where only computer studies teachers are required to study ICT in their pre-service programs.

UNESCO (2011) stated that a fundamental issue that may hinder schools and teachers in their efforts to benefit from ICT is whether teachers know how to use ICT effectively in their teaching. Kim et al., as cited by Ciftci and Aladag (2018), stated that a lack of knowledge and skills in digital content evaluation is one of the struggles for teachers when it comes to integrating digital technologies into their classes. UNESCO highlighted that there was a lack of detailed information reaching the school and teacher level and that the nature of 21st century skills were not well understood.

There are various issues and challenges that are currently being experienced by teachers when it comes to teacher preparation and promoting DCC in schools. Some teachers lack the knowledge and skills in adjusting to the advancement of technology being used for teaching. The training and other interventions provided were also not enough, thus leading to an ineffective way of promoting DCC.

The above-mentioned issues and challenges concerning digital citizenship show that

people need to have a better understanding of the appropriate knowledge and skills and training needs so that we can properly address the evolving concerns. The problems being encountered generally arise from the individual level to the societal level. In addition, it would be a continuous work in progress, especially in developing ICT-related policies and integrating it into the educational sector. Thus, we cannot expect that individuals and society would easily adjust to the current advancement in using technologies.

## CONCLUSION

Even though the concept of digital citizenship is not new, the literature and research studies to support it are still evolving. Variations on how to promote digital citizenship in education are the results of various factors such as teacher preparation, school context, digital leadership, policies and programs of the school and ministry, and technological resources. But these variations, issues, and challenges of digital citizenship have opened further discussion and studies not only at the school level but also on the national and international scale.

Therefore, digital citizenship stresses the importance of equipping learners with the essential skills, addressing the digital divide, adapting to technological advancements, and fostering strong leadership in promoting responsible digital behaviors. This paper highlights the evolving nature of digital citizenship and the need for ongoing research and collaboration among different stakeholders such as educators, policymakers, and researchers to ensure the effectiveness of digital citizenship education. By addressing the identified gaps and implementing evidence-based practices, we can better equip the learners with digital skills and prepare them to become more responsible, ethical, and empowered digital citizens in an increasingly digital world.

## References

- Agustina, R., Kamdi, W., Hadi, S., Muladi, M., Nurhadi, D., & Umnati, S. (2020). Leadership Selection at Vocational Education Based on Digital Leadership Model Using AHP Method. In 2020 4th International Conference on Vocational Education and Training (ICOVET) (pp. 36-40). IEEE.
- Alberta Education. (2012). Digital Citizenship Policy Development Guide. Edmonton, Alberta, Canada: Alberta Education.
- Aldawood, H., Alhejaili, A., Alabadi, M., Alharbi, O., & Skinner, G. (2019). Integrating Digital Leadership in an Educational Supervision Context: A Critical Appraisal. In 2019 International Conference in Engineering Applications (ICEA) (pp. 1-7). IEEE.
- Antonio, A., & Tuffley, D. (2014). The gender digital divide in developing countries. *Future Internet*, 6(4), 673-687.
- Asian Development Bank Asian Development Bank. (2018). ICT for Better Education in the Pacific. Metro Manila, Philippines.



- Ata, R. & Yildirim, K. (2019). Turkish pre-service teachers' perceptions of digital citizenship in education programs. *Journal of Information Technology Education: Research*, 18, 419-436.
- Atif, Y., & Chou, C. (2018). *Digital citizenship: innovations in education, practice, and pedagogy*. *Journal of Educational Technology & Society*, 21(1), 152-154.
- Beurkens, N. (2017, November 18). Dr. Nicole Beurkens: Holistic Child Psychologist. Retrieved from <https://www.drbeurkens.com/dangersoverexposure-electronics-kids-mental-physical-health/>.
- Borowska, G. B. (2019). Digital leadership for digital transformation. *Współczesna Gospodarka*, 10(34), 11-19.
- Buchholz, B. A., DeHart, J., & Moorman, G. (2020). Digital citizenship during a global pandemic: moving beyond digital literacy. *Journal of Adolescent & Adult Literacy*, 64(1), 11-17.
- Care, E. (2019). Country examples of education shifts in 21st century skills. The Australian Council for Educational Research Ltd (ACER). Victoria: The Australian Council for Educational Research Ltd (ACER).
- Choi, M. (2016). A concept analysis of digital citizenship for democratic citizenship education in the internet age. *Theory & research in social education*, 44(4), 565-607.
- 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. *Computers & Education*, 107, 100–112. <https://doi.org/10.1016/j.compedu.2017.01.002>
- Chua Reyes, V. (2015). How do school leaders navigate ICT educational reform? Policy learning narratives from a Singapore context. *International Journal of Leadership in Education*, 18(3), 365-385.
- Ciftci, S., & Aladag, S. (2018). An Investigation of Pre-Service Primary School Teachers' Attitudes towards Digital Technology and Digital Citizenship Levels in Terms of Some Variables. Efeler, Aydin, Turkey.
- Council of Europe. (2017, August). Digital Citizenship Education: Working Conference. Strasbourg, France.
- Damayanti, F. P., & Mirfani, A. M. (2021). An Analysis of Digital Leadership in the Pandemic Covid-19 Era In 4th International Conference on Research of Educational Administration and Management (ICREAM 2020) (pp. 156-159). Atlantis Press.
- Dexter, S. (2008). Leadership for IT in schools. In *International handbook of information technology in primary and secondary education* (pp. 543-554). Springer, Boston, MA.
- eTwinning. (2016). Growing Digital Citizens. Central Support Service for eTwinning. Belgium, Europe

- Fernández-Prados, J. S., Lozano-Díaz, A., & Ainz-Galende, A. (2021, March). Measuring Digital Citizenship: A Comparative Analysis. In *Informatics* (Vol. 8, No. 1, p. 18). Multidisciplinary Digital Publishing Institute.
- Fragouli, E., & Ibidapo, B. (2015). Leading in crisis: Leading organizational change & business development. *International Journal of Information, Business and Management*, 7(3), 71.
- Fredriksen, E. (2016). The Digital space in the English classroom. A study of the use of digital tools in the teaching of EFL in the Norwegian Upper Secondary School (Master's thesis, The University of Bergen).
- Gasser, U., & Palfrey, J. G. (2007). Breaking down digital barriers: When and how ICT interoperability drives innovation. Berkman Center Research Publication, (2007-8).
- Gleason, B., & Gillern, S. V. (2018). Digital citizenship with social media: Participatory practices of teaching and learning in secondary education. *Journal of Educational Technology & Society*, 21(1), 200-212.
- Hollandsworth, R., Dowdy, L., & Donovan, J. (2011). Digital citizenship in K-12: It takes a village. *TechTrends*, 55(4), 37-47.
- Hughes, H., & Jones, S. (2020). Opinion: This is not home schooling, distance learning, or online schooling. *The Atlanta-Journal Constitution*
- Jackson, K. M., & Marriott, C. (2012). The interaction of principal and teacher instructional influence as a measure of leadership as an organizational quality. *Educational Administration Quarterly*, 48(2), 230-258.
- James, C., Weinstein, E., & Mendoza, K. (2019). Teaching digital citizens in today's world: Research and insights behind the Common-Sense K–12 Digital Citizenship Curriculum. Common Sense Media.
- Jones, L. M., & Mitchell, K. J. (2016). Defining and measuring youth digital citizenship. *New media & Society*, 18(9), 2063-2079.
- Khan, S. (2016). Leadership in the digital age: A study on the effects of digitalisation on top management leadership.
- Kirkland, K., & Sutch, D. (2009). Overcoming the barriers to educational innovation: A literature review. Futurelab.
- Kivunja, C. (2014). Theoretical perspectives of how digital natives learn. *International Journal of Higher Education*, 3(1), 94-109.
- Kozma, R. B. (2008). Comparative analysis of policies for ICT in education. In *International handbook of information technology in primary and secondary education* (pp. 1083-1096). Springer, Boston, MA.

- Lauricella, A. R., Herdzina, J., & Robb, M. (2020). Early childhood educators' teaching of digital citizenship competencies. *Computers & Education*, 158, 103989.
- Le, Vinh, A., Do, D. L., Pham, D. Q., Hoang, P. H., Duong, T. H., Nguyen, H. N., ... & Vuong, Q. H. (2019). Exploration of youth's digital competencies: a dataset in the educational context of Vietnam. *Data*, 4(2), 69.
- Le Vinh, A., Duc Quang, P., & Do Lan, D. (2019). The DKAP Project The Country Report of Vietnam. Pham and Duc Lan, Do, The DKAP Project The Country Report of Vietnam (May 23, 2019).
- Lindqvist, M. H., & Pettersson, F. (2019). Digitalization and school leadership: on the complexity of leading for digitalization in school. *The international journal of information and learning technology*.
- Livingstone, S. D. (2017, October). Children's online activities, risks, and safety: A literature review by the UKCCIS Evidence Group. London, United Kingdom.
- Mossberger, K. (2009). Toward digital citizenship: Addressing inequality in the information age. *Routledge handbook of Internet politics*, 173-185.
- Mossberger, K., Tolbert, C. J., & McNeal, R. S. (2008). Digital citizenship. The internet, society, and participation, 1.
- Murashkin, M., & Tyrväinen, J. (2020). Adapting to the new normal: A qualitative study of digital leadership in crisis.
- Ottestad, G. (2013). School Leadership for ICT and Teachers' Use of Digital Tools.
- Özüdoğru, G. (2021). Problems faced in distance education during Covid-19 Pandemic. *Participatory Educational Research*, 8 (4), 321-333. DOI: 10.17275/per.21.92.8.4
- Park, Y. (2019). DQ Global Standards Report. DQ Institute, Singapore.
- Peeraer, J., Mai Thy, T. N., & Thai Ha, T. T. (n.d.). Policy Analysis Integration of ICT in Education in Vietnam: Translation and Implementation in Teacher Education. Hanoi, Vietnam.
- Peeraer, J., & Tran, T. (n.d.). Integration of ICT in Education in Vietnam: from Policy to Practice.
- Promsuwan, P., Wichitputchraporn, W., Niyamabha, A., Prachongchit, S., Sakulthanasakdi Moore, K., & Koedsuwan, S. (2019). A Model of Digital Leadership Development for Principals of Small Size Schools under the Office of the Basic Education Commission. *Asian Political Science Review*, 3(2).
- Qureshi, A. A. (2013). Impact of leadership on meaningful use of ICT. *Procedia-Social and Behavioral Sciences*, 93, 1744-1748.
- Ribble, M. S., Bailey, G. D., & Ross, T. W. (2004). Digital citizenship: Addressing appropriate

- technology behavior. *Learning & leading with technology*, 32(1), 6.
- Ribble, M. (2011). *Digital citizenship in schools* (2nd Ed). Washington, DC: ISTE
- Ribble, M., & Miller, T. N. (2013). Educational leadership in an online world: Connecting students to technology responsibly, safely, and ethically. *Journal of asynchronous learning networks*, 17(1), 137-145.
- Rice, R. E., & Pearce, K. E. (2015). Divide and diffuse: Comparing digital divide and diffusion of innovations perspectives on mobile phone adoption. *Mobile Media & Communication*, 3(3), 401-424.
- SEAMEO INNOTECH. (2016). *Nurturing Critical and Creative Thinkers through Inquiry-Based Teaching and Learning in Early Childhood Care and Education*. Educational Innovations Unit. Quezon City: SEAMEO INNOTECH.
- Snyder, S. (2016). Teachers' perceptions of digital citizenship development in middle school students using social media and global collaborative projects.
- Shelley, M., Thrane, L., Shulman, S., Lang, E., Beisser, S., Larson, T., & Mutiti, J. (2004). Digital citizenship: Parameters of the digital divide. *Social Science Computer Review*, 22(2), 256-269.
- Sheninger, E. (2014). Pillars of digital leadership. International Center for Leadership in Education, 1-4.
- Stuart, L. H., Mills, A. M., & Remus, U. (2009). School leaders, ICT competence and championing innovations. *Computers & Education*, 53(3), 733-741
- Suson, R. L. (2019). Appropriating digital citizenship in the context of basic education. *International Journal of Education, Learning and Development*, 7(4), 44-66.
- The HEAD Foundation. (2017, January). *ICT in ASEAN Education: Challenges and New Opportunities*. Singapore.
- Tiekam, A. (2019). *Digital leadership skills that South African leaders need for successful digital transformation* (Doctoral dissertation, University of Pretoria).
- Trilling, B., & Fadel, C. (2009). *21st century skills: Learning for life in our times*. John Wiley & Sons.
- UNESCO. (2011). *UNESCO ICT Competency Framework for Teachers*. Paris, France: UNESCO.
- UNESCO. (2019a). *Digital Kids Asia Pacific: Regional Findings and Policy Recommendations*. UNESCO.
- UNESCO. (2019b). *Digital Kids Asia Pacific: Insights into Children's Digital Citizenship*. Bangkok, Thailand: UNESCO.
- UNESCO Bangkok. (2014). *Fostering Digital Citizenship through Safe and Responsible Use of ICT*:

A Review of National Policies and Initiatives in Asia Pacific. Bangkok, Thailand.

UNESCO Bangkok. (2015). Fostering Digital Citizenship through Safe and Responsible Use of ICT: A review of current status in the Pacific as of December 2014. Bangkok, Thailand.

UNICEF. (2011). Child Safety Online: Global challenges and strategies. Florence, Italy.

Walters, M., Gee, D., and Mohammed, S. (2019). "A Literature Review-Digital Citizenship and Elementary Education". The Richard W. Riley College of Education and Leadership Publications. 198. [https://scholarworks.waldenu.edu/cel\\_pubs/198](https://scholarworks.waldenu.edu/cel_pubs/198)

Yücebalkan, B. (2018). Digital leadership in the context of digitalization and digital transformations. *Current academic studies in social science*, 1, 489-505.

Yusof, M. R., Fuad, D. R. S. M., Rafidah, D., Mohd Yaakob, M. F., Don, Y., & Ibrahim, I. (2020). Digital communication: Priorities in the relationship of principal leadership and collaborative community at Malaysian school. *Universal Journal of Educational Research*, 8(4), 1149-1154.

Zhong, L. (2017). Indicators of digital leadership in the context of K-12 education. *Journal of Educational Technology Development and Exchange (JETDE)*, 10(1), 3.