Journal of Educational Technology & Online Learning
Volume 8 | Issue 2 | 2025

JETOL
Journal of Educational Technology & Online Learning

Digital citizenship in Cambodian upper secondary schools: A curriculum review using the Digital Kids Asia-Pacific framework for education

Sreynet Un [a] *

[a] Hiroshima University, Graduate School of Humanities and Social Sciences, Japan.

Suggested citation: Un, S. (2025). T Digital citizenship in Cambodian upper secondary schools: A curriculum review using the Digital Kids Asia-Pacific framework for education. *Journal of Educational Technology and Online Learning, 8*(2), 206-225.

Highlights

- The secondary school curriculum requires reform through leveraging awareness among education stakeholders; enhancing their capacities to address digital citizenship underrepresentation in the education system, i.e., digital safety and resilience; digital emotional intelligence; creativity and expression; by harmonizing content with the regional framework.
- The study underscores the value of cross-disciplinary integration of digital citizenship to foster a comprehensive understanding of effective digital participation.
- Policy implementation and its outcomes are needed to ensure an understanding of how DC principles are effectively integrated in the curriculum.
- Further research can explore challenges and innovative approaches to bridge the gaps in digital citizenship competencies required for students in diverse settings.

Abstract

Since its emergence, technology has progressed beyond knowledge. Therefore, competencies are needed to navigate it safely, responsibly, and ethically. A well-designed curriculum forms the core of school strategies to enhance students' competencies and learning outcomes. This study examines the integration of digital citizenship concepts in Cambodian upper secondary education and identifies areas for improvement through the lens of the Digital Kids Asia-Pacific (DKAP) framework. Using thematic analysis of curriculum documents, this study categorizes digital citizenship (DC) elements within the DKAP framework's core competencies, such as digital safety, ethical participation, and responsible use, in an indicator matrix. The findings reveal that although the Cambodian upper secondary education curriculum partially addresses digital citizenship competencies, considerable gaps remain in digital safety and resilience, digital emotional intelligence, and digital creativity and expression. The need for broader practical integration of DC across subjects calls for more attention to curriculum expansion and alignment with the DKAP framework. This study pinpoints the value of cross-disciplinary integration of DC to encourage the acquisition of a broad understanding of effective and ethical digital participation. Identifying well-rounded approaches, teacher training, and topics is critical to stimulate effective digital citizenship practices in the Cambodian context and others with similar characteristics.

Article Info: Research Article

Keywords: *Digital Citizenship, Policy analysis, Curriculum mapping, Upper secondary school*

1. Introduction

Embracing digital transformation is optimal for contributing to quality education and providing opportunities that prepare students to access and keep up with modern society (Giannoutsou et al., 2024; Timotheou et al., 2023). In contrast to its potential, digital technology also has its fair share of negative impacts, including those affecting education, health, and well-being(Cain, 2018; Gottschalk, 2019;

* Corresponding author. Hiroshima University, Graduate School of Humanities and Social Sciences, Japan
e-mail address: sreynetun@gmail.com
The author would like to express her heartfelt gratitude to the Ministry of Education, Youth and Sport of Cambodia for providing access to the upper secondary school curriculum and supporting materials. I am also thankful to my academic advisors and lab mates at Hiroshima University for their invaluable guidance and encouragement throughout this research.

Doi: http://doi.org/10.31681/jetol.1639704
Received 14 Feb 2025; Accepted 12 May 2025
ISSN: 2618-6586.

Meates, 2020; Komar Rikreay Association, 2021; OECD, 2024b), and harmful behaviors, such as the prevalence of cyberbullying and online harassment (Copp et al., 2021; Dhamodharan & Sunaina, 2023; Slaughter & Newman, 2022).

Many countries have empowered students' mastery of digital technology, promoting their broad understanding of how it works (OECD, 2018, 2023). However, insights from UNICEF (2021) addressed the critical challenges young people face in acquiring digital literacy owing to limited access to resources and training in schools. The study further argued that the global shift to digitalization in education left a gap in access to technology and digital skills. Many countries face challenges in reimagining and shaping more peaceful, just, and sustainable societies through transforming education, while their education systems fail to address the latest interconnected challenges from global warming and biodiversity loss to the accelerated digital revolution, deepening inequalities and democratic backsliding, conflict, and crisis (James et al., 2021; OECD, 2018; UNESCO, 2019a). To address the current demand, Asia-Pacific region education leaders and relevant stakeholders have committed to two priority actions – ensuring safe school return and creating enabling learning environments, and transforming education and its systems (UNESCO, 2022). With the increased reliance on digital technologies, Digital Citizenship Education (DCE) plays critical role in modern education, encompassing the ethical, social, and participatory aspects of utilizing digital tools and platforms, leveraging opportunities, and mitigating the associated risks (UNESCO, 2023). To support policymakers, educators, and students with the necessary tools and resources to navigate the evolving digital landscape, UNESCO (2019a) in collaboration with multiple stakeholders, introduced the Digital Kids Asia-Pacific (DKAP) framework for education, aimed at guiding the integration of digital technologies in education across the Asia-Pacific region. The framework comprises five competency domains and 16 competencies: *Digital Literacy, Digital Safety and Resilience, Digital Participation and Agency, Digital Emotional Intelligence,* and *Digital Creativity and Innovation*. It articulates essential competencies—the cognitive, behavioral, and socio-emotional dimensions of children's development—to enable children's complete participation in the digital world while maintaining awareness of their rights and protection against contemporary digital harm, which can substantially affect individuals, communities, and societies. The DKAP framework emphasizes the need for a well-rounded approach to digital literacy, acknowledging that technical skills alone are insufficient for success in the digital era, but critical thinking, innovation, and other crucial competencies for lifelong learning in an evolving digital landscape. The framework was crafted to be adaptable, allowing for the incorporation of local and regional contexts, as well as the unique needs and attributes of diverse educational systems across the Asia-Pacific region.

In parallel, the Royal Government of Cambodia, through the Ministry of Education, Youth and Sport (MoEYS), has endeavored to create healthy, motivated, and committed learners for the future of the nation and world by 2030 (MoEYS, 2019). Compared to other Asia-Pacific countries, Cambodia has a unique combination of rapid digital adoption, limited digital literacy, sociocultural sensitivities, and emerging economic needs, making DC education a priority; it is essential to not only protect individuals from cyber risks but also empower their use of technology to promote personal growth, societal development, and economic progress.

In Cambodia, the proportion of Internet users increased from 51% (2019) to 56.7% (2024) of the total population, and from 51% to 68.4% of social media users[1]. The pivotal demands of Internet-powered devices have significantly increased in communication, research, learning, and cooperation, and online behaviors toward and competency in digital technology engagement have emerged as prevalent concerns, particularly among children and adolescents (Ministry of Post and Telecommunications, 2023; UNICEF, 2022a). However, the digital literacy levels among Cambodians remain unclear. According to UNICEF (2022b), over 80% of Cambodian adolescents, aged 14-17, many of them in urban areas, were active Internet users, and about 11% of those were victims of online sexual exploitation and abuse through various online activities. Several studies in Cambodia have highlighted vulnerability to misinformation,

[1] https://datareportal.com/reports/digital-2024-cambodia?rq=Cambodia

cyber risks, and online behaviors toward digital technology engagement (e.g., media literacy) as prevalent concerns, particularly among children and adolescents (Lim, 2023; Ministry of Post and Telecommunications, 2023; UNICEF, 2022b). As stated in the Program for International Student Assessment (PISA) 2022, Cambodia reported a lower index of school responsibility for curriculum readiness for digital learning than the OECD average [2]. Student performance was found to be unsatisfactory, and students spent more hours on screen time at school during regular lessons.

Excessive technology use is increasingly prevalent, affecting adolescents' health, well-being, academic performance, and socio-emotional development (Fekih-Romdhane et al., 2023; Gottschalk, 2019; Komar Rikreay Association, 2021; Nizariah & Suhendrayatna, 2021). This reflects young adolescents' limited competence in controlling their behaviors and emotions in harnessing digital technology. Moreover, inadequate policy and institutional support is a gap in equipping individuals with the knowledge and skills to contribute positively to the digital era. One study by CHEA et al. (2022) highlighted that Cambodian secondary school teachers are not ready for ICT integration in teaching and learning. Regarding sociocultural sensitivities, Cambodia's Freedom on the Net 2024 reported partial freedom in terms of the country's Internet access, content, and freedom of speech (Funk et al., 2024). Cambodia's sociopolitical environment impacts digital behavior, with cultural norms (e.g., respecting authority and practicing self-censorship) and government policies shaping online expression. Culturally, Cambodian students' mindset remains less critical, curious, and flexible, which has hindered the development of entrepreneurial digital global citizens (CASADIO et al., 2021). Among all Southeast Asian nations, Cambodia boasts the largest population of youth and adolescents, who represent the potential workforce driving economic and social development; approximately 60% of them engage in digital technology adoption and services, such as e-commerce, fintech, and cloud services. This transformation is driven by a combination of government initiatives and private sector innovation aimed at modernizing the economy(Supreme National Economic Council, 2021). However, addressing deficiencies in digital skills among youths to alter market demand remains an urgent focus (DASH et al., 2021).

A well-designed curriculum forms the core of school strategies aimed at enhancing students' competencies and improving their learning outcomes. It is a complex and multifaceted concept that encompasses not only the content and structure of what is taught but also the processes and methods used to facilitate learning. Consequently, examining the curriculum thoroughly is essential to nurture the competencies required for the contemporary education landscape by ensuring pertinent, adaptive, and innovative educational contents at all settings (OECD, 2024a). UNESCO (2023) suggested the importance of collaboration to develop a common regional curriculum standard and criteria for DC to allow localization in country-specific policy contexts. The report encourages countries to deepen their understanding of framing and implement a more pragmatic and purposeful curriculum as an essential asset for developing digital skills. Therefore, analyzing the alignment of the Cambodian curriculum reflecting the regional standard is paramount, as evidence on the compatibility of the national curriculum with the regional framework is lacking, particularly in developing countries such as Cambodia.

2. Literature Review

2.1. Conceptualization of DC

The essence of DC lies in a sense of responsibility and ethically engaging with the online sphere while fostering a constructive digital landscape. Such concept has evolved, reflecting technology advancements, and has been discussed for decades (Chen et al., 2021). Recent studies have explored various perspectives on and approaches to DC, highlighting its multifaceted nature (Council of Europe, 2019; James et al., 2021; Kim & Choi, 2018; UNESCO, 2019a). The multifaceted nature of DC has led to a complex relationship between citizens and the digital realm, includes collective identities and social networks, which produce diverse educational, sociopolitical, and other perspectives on DC (Culminas-colis &

[2] https://www.oecd-ilibrary.org/sites/a97db61c-en/index.html?itemId=/content/publication/a97db61c-en

Reyes, 2024; Fernández-Prados et al., 2021). The concept of DC in education has been discussed comprehensively; however, it remains misunderstood (Chen et al., 2021; Ribble & Park, 2019). To address this challenge, researchers have proposed multiple frameworks and models that provide guidelines for understanding and teaching DC by integrating it into curricula. These frameworks underlie the importance of cultivating digital competence, a culture of information, and students to engage in civic and political participation in the digital environment (Chen et al., 2021; James et al., 2021; Kim & Choi, 2018; Ribble & Park, 2019; UNESCO, 2019a).

Ribble & Bailey (2007) developed a broad range of nine fundamental elements as passports to DC, guiding students on interacting conscientiously and efficiently with technology as effective digital citizens, emphasizing skills and behavioral practices including access, communication, etiquette, literacy, law, rights, wellness, commerce, and security. Regarding the drastic development of technology, some institutions have committed to updating practical standards aligned with the nine elements of responsive implementation (Ribble & Park, 2019; The Council of Europe, 2019). For example, Ribble & Park (2019) structured the nine elements in the S3 framework–Safe, Savvy, and Social–to understand the intricacy of DC and technology risks, abuse, and misuse. This framework offers a practical lens through which the International Society for Technology in Education (ISTE), focusing on teaching and learning. Comparatively, The Council of Europe (2019) outlined the competency framework for democratic culture by incorporating DC as one of the key dimensions to foster responsible digital citizens. It was conceptualized by ten digital domains in three main areas – *Being online, Well-being online, and Rights online* – which lie on 20 competencies for democratic cultures, which underpin the overall competencies – Knowledge and critical understanding, Skills, Attitudes, and Values – necessary to be responsible digital citizens.

In 2019, the Digital Intelligence (DQ) Institute, in collaboration with the Coalition for Digital Intelligence (CDI)[3] endorsed a DQ Framework, a global standard encompassing digital literacy, skills, and readiness, for successful development in the digital world. DQ is known as a "*comprehensive set of technical, meta-cognitive and socio-emotional competencies that are grounded in the universal moral values and that enable individuals to face the challenges and harness the opportunity of digital life*." (DQ Institute, 2019). DQ framework comprises 24 competencies across 8 areas of digital life – identity, use, safety, security, emotional intelligence, literacy, communication, and rights – at 3 levels: 1) Citizenship (use technology safely and responsibly), 2) Creativity (turn ideas into reality), and 3) Competitiveness (drive entrepreneurship, growth, and impact). Simultaneously, the DKAP framework, developed by UNESCO, is a comprehensive approach to addressing children's evolving digital education demands in the Asia-Pacific region. The framework aims to create a holistic understanding of digital competence, encompassing not only the ability to use digital tools and technologies but also the critical thinking and problem-solving skills required to navigate the digital world (UNESCO, 2019b). The framework's five domains collectively provide a holistic approach to addressing children's cognitive, behavioral, and socio-emotional dimensions, comprising 16 competencies in five domains (Fig. 1).

[3] CDI is an international platform created in 2018 by the OECD, IEEE SA, and DQ Institute in line with the World Economic Forum.

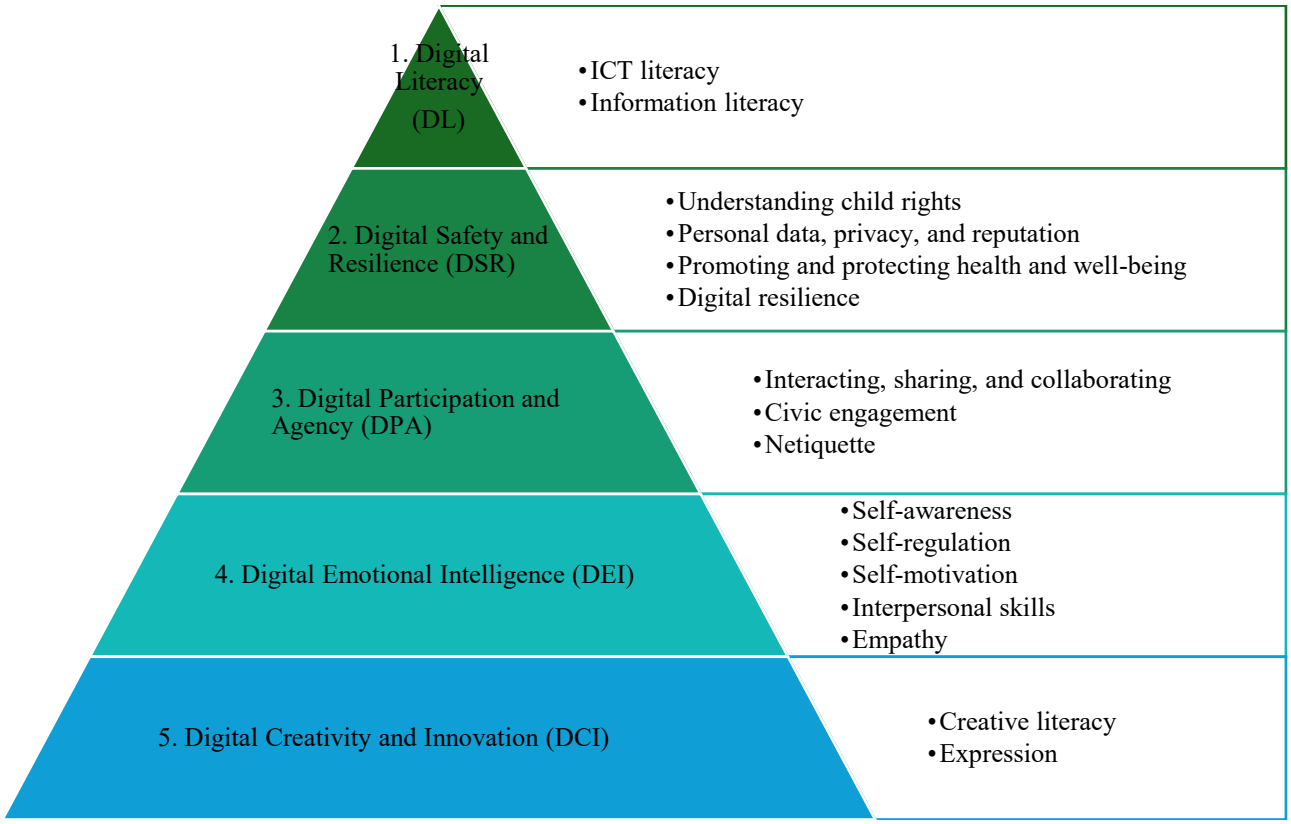

Fig. 1. Digital Kids Asia-Pacific framework for education.

James et al. (2021) highlighted various concerns among young people regarding their digital lives. These concerns include cyberbullying, digital footprints, and the pressure to stay connected. The study also identified 10 critical topics that reflect the current digital landscape and students' experiences, such as digital drama, privacy risks, and social media's impact on self-esteem. These results underscore the need for a responsive and relevant DC curriculum that addresses students' real concerns while preparing them for the digital world's complexities. The European Digital Competence Framework (Dig Comp 2.2) introduced a common understanding of digital competence comprising many examples of competencies that enable citizens to engage confidently, critically, and safely with digital technologies as well as new and emerging ones, such as systems driven by artificial intelligence (AI) (Vuorikari et al., 2022). The framework centers on digital skills across five dimensions – information and data literacy, communication and collaboration, digital content creation, safety, and problem-solving – for personal, social, and professional growth that is applicable for workforce training and lifelong learning. The core competencies for lifelong learning are interlinked with other competencies – literacy, cultural awareness and expression, entrepreneurship, civic competence, personal, social, learning-to-learn, digital competence, STEM, and language – which contribute to tackling digital setbacks such as misinformation and disinformation, datafication of Internet services and apps, citizenship interacting with AI systems, advanced technologies, environmental sustainability concerns, and emerging contexts.

DC frameworks are interconnected and aligned in several ways, as they aim to foster responsible, ethical, and effective engagement in the digital world. All frameworks share the foundation of core competencies, focusing on digital literacy, safety and well-being, ethical behavior, responsible participation, and innovation. Each framework contributes differently to education, policy orientation, and workforce development. Most of those frameworks has been developed and implemented in European contexts, whereas DKAP framework has not been found in any studies yet.

2.2. Roles of DC

In a changing world, the notion of DC has drawn increasing attention because of its impact. Its significance to education lies in its contribution to country-civic values and norms, by informing citizens about their rights and responsibilities, and upskilling twenty-first century competencies for work

(UNESCO, 2023). With this regard, DC education plays a crucial role in students' holistic development to effectively navigating complex and dynamic environments (Jones & Mitchell, 2016). Many studies suggested diverse DC curricula and teaching approaches, emphasizing its complex and multifaceted nature. By embedding DC concepts across various subject areas, educators can offer students authentic contexts in which to apply these skills (James et al., 2021). This includes teaching students how to fact-check, recognize bias, and understand the implications of their digital footprint. To transition DC into practice, curriculum provides a tool to determine what aspects of DC learners should acquire; nonetheless, curriculum development and its implementation, monitoring, and evaluation remain uncertain (Ribble & Park, 2019).

Various models constructed relevant topics addressing critical issues students confront in the digital realm to ensure students are resilient to digital dilemmas. Some frameworks emphasize digital skills and competencies, whereas others concentrate on fostering civic and political engagement in digital spaces. UNESCO(2019a) has provided significant implications for educational policies and curriculum development. Various countries, such as Bangladesh, Vietnam, and Fiji, considered integrating the DKAP framework into their national education policies, reflecting the importance of aligning educational practices with children's digital competencies by fostering beyond ICT skills but also a sense of empowerment and agency in response to SDGs. Nevertheless, this framework practices and monitoring remain lagged behind, particularly in ASEAN contexts.

Simultaneously, the Common Sense Education curriculum was developed based on insights from collaborative research with diverse stakeholders, educators, and parents to create a positive digital environment. The curriculum mainly aligned with US education standards, such as Common Core (ELA), ISTE, CASEL, AASL, and TEK, and comprised 73 lessons (32 videos) with six core topics addressing contemporary digital issues: media balance and well-being, privacy and security, digital footprint and identity, relationships and communication, cyberbullying, digital drama and hate speech, and news and media literacy, across all levels. Relatively, the ISTE designed its curriculum based on nine fundamental elements of DC at all levels, from elementary to secondary school. The model recommends a flexible application, either embedded or integrated.

- Primary and early elementary levels: rights and responsibilities, communication and collaboration, fluency, and etiquette. It aims to involve students, role models, curiosity, helpfulness and empathy.
- Upper elementary: security and privacy, rights and responsibilities, communication and collaboration, fluency, etiquette, and access.
- Middle level: security and privacy, rights and responsibilities, health and welfare, commerce, law, communication and collaboration, fluency, etiquette, and access.
- High School level: security and privacy, health and welfare, commerce, law, communication and collaboration, fluency, etiquette, and access.

Curricula can provide a comprehensive foundation for students to thrive in the digital age by integrating DC concepts across subject areas, developing critical thinking and information literacy skills, promoting ethical behavior, enhancing digital literacy, encouraging creativity and innovation, fostering global awareness, and addressing emerging technologies. How the curriculum should be implemented – learning DC or learning *through* DC – remains questionable. A study by Öztürk (2021) highlighted that small-scale of research examined the curricular within the framework of DC and suggested more exhaustive analysis of existing policies in educational settings.

2.3. Previous Studies on Digital Citizenship in Cambodia

Cambodia has made substantial changes through its secondary education curriculum to support its economic progress and sustainable growth goals. The MoEYS recognizes the consequence of updating the education system to provide students with the skills needed to thrive in a competitive global market (MoEYS, 2024). Cambodia's secondary education curriculum reform focused on modernizing teaching

practices and improving educational outcomes to better prepare students for the demands of the 21st century, ensuring youths possess holistic competencies. According to PISA 2022, student performance increased compared to the previous result but remained lower than that in other ASEAN countries and the OECD average due to critical factors, including curricula. Hence, MoEYS (2024) prioritized its reform efforts in strengthening school governance, reviewing curricula and extracurricular activities, and advancing digital education. The reform represents a pivotal step toward building a robust, future-ready education system by a by a shift toward competency-based education, emphasizing critical thinking, problem-solving, digital literacy, and socio-emotional skills (MoEYS, 2016). The government seeks to address the evolving needs of students and the labor market by prioritizing competency-based learning, STEM, digital literacy, and equity. However, the success of these reforms hinges on sustained investment, capacity building for educators, and inclusive policy implementation.

As Cambodia continues its journey toward modernization, its commitment to educational reform will be central to achieving long-term economic and social development. Previous studies on ICT and digital skills in Cambodian education have highlighted both movements and setbacks. Studies have shown that while the Cambodian government has endeavored to integrate technology into the education system, significant barriers remain, including geographical disparities in school facilities and access to technology, few teachers specializing in ICT, a shortage of digital resources, limited development for teachers, financial constraints, digital literacy, technological infrastructure, institutional leadership support, and resistance to change (Flores & Mean, 2024; Keo et al., 2024a; MoEYS, 2024; Pang et al., 2022). As the COVID-19 pandemic has further underscored the concerns of digital skills, Pang et al. (2022) found that Cambodian teachers, specifically in upper secondary schools, had a positive attitude toward using ICT in teaching, but less than half implemented it in their teaching due to poor access to computers and the Internet. Flores & Mean (2024) highlighted that digital transformation in Cambodian higher education positively influences teaching and learning outcomes, but challenges such as financial constraints and digital literacy must be addressed for sustainable adoption. In addition, Keo et al. (2024a) noted that the optimal integration of educational technology in Cambodian higher education involves overcoming challenges and leveraging opportunities by strictly enforcing policies to ensure enhanced educational outcomes. These findings emphasize the exigency of ongoing investment in ICT infrastructure, teachers' professional development, and the creation of culturally relevant digital content to enhance digital literacy across Cambodia's education sector.

This literature review highlights the complex landscape of ICT and digital skills in Cambodia's educational system, revealing progress and persistent challenges. Further research is required to address the gaps in comprehension and inform evidence-based policies for leveraging digital literacy and ICT integration in Cambodian education.

Through a comprehensive analysis, this study aims to understand in what way to prepare the students to involve in the contemporary digital environment actively and safely through examining which domains of DC have been aligned in the Cambodian upper secondary curriculum and identifies areas for improvement. It is fundamental to cover multi-level analysis – the policy, curriculum, and specific subjects' perspectives. The insights from this context-specific study could inform policymakers and educators about the deficiencies in the current education system regarding addressing DC concepts, and how well Cambodia is preparing its students to engage in a global, technology-driven economy. Despite the global emphasis, this contextual analysis can further offer a case-study actionable recommendations to educational stakeholders to align educational practices with the demands of an increasingly digital world, contributing to the broader effort of equipping students with the competencies required for effective and ethical digital participation. The gaps identified in the curriculum and policies will inspire innovation in educational technology to develop tools, platforms, and strategies that ensure students acquire crucial digital citizenship competencies, beyond ICT literacy. This study extensively deepens the theoretical insights and proposes methodological approaches for future studies. The framework analysis of cross-disciplines in the study can offer empirical evidence on barriers of implementing global frameworks,

particularly DKAP, in low-resource settings, prompting research on culturally and contextually sensitive approaches, and provide a model for conducting interdisciplinary studies.

To achieve the above-mentioned objectives, the following research questions are posed:

a) How is the DKAP framework reflected in national education policies or curriculum guidelines?

b) How are DC competencies addressed in the Cambodian upper secondary education curriculum?

c) Do any specific subjects predominantly address DC concepts?

3. Methodology

This study employs a qualitative approach to comprehensively understand the integration of DC into Cambodian education. The analysis was conducted by creating a matrix that aligned the criteria with the regional standards of DC in the DKAP framework for education to visualize strengths and areas for improvement. Key documents to be examined in this study include relevant Cambodian digital education policies and official curriculum frameworks and subject syllabi, currently implementing in upper secondary education.

To address the first research question, this study conducts a policy analysis of key documents, including Cambodia's national education policies, strategic plans, and master plan, to identify references to the DKAP framework and its dimensions. This method highlights Cambodia's alignment with regional and global efforts to promote digital citizenship. The relevant policy documents were analyzed through a thematic framework and deductive coding to determine the present and underrepresented dimensions of the DKAP addressing Cambodian policies. The analytical framework includes verifiable references in policy documents such as visions, objectives, and strategies that align with the DKAP principles.

This study addresses the second research question by conducting a document analysis of official curriculum frameworks and subject syllabi to identify explicit and implicit references to DC competencies. This analysis examined the curriculum for keywords and themes such as digital literacy, digital safety and resilience, digital participation and agency, digital emotional intelligence, and digital creativity and innovation. This provides insights into how DC is embedded in the curriculum. The goals and objectives of each syllabus and curriculum framework were explicitly coded to determine whether they incorporated the concept of digital competencies.

The last research question examines whether DC concepts are primarily addressed in specific subjects, such as ICT and moral-civic education. This investigation employed curriculum mapping to systematically identify DC topic distribution across various subjects and units. The relevant subject content was comprehensively analyzed to determine the coverage of DC themes. A coding framework was developed based on existing literature on DC, key dimensions of the DKAP framework, and themes relevant to the research question. The coding framework included both deductive codes (predefined based on prior knowledge) and key domains and competencies explicitly defined to ensure consistency during analysis. The unit of analysis (e.g., the lesson objectives), was assigned as a code based on its relevance to DC concepts. The content within each code was analyzed to identify the coverage of DC concepts in each subject and determine whether certain subjects predominantly emphasized DC.

To ensure the inter-coder reliability and validity of the data coding, the author developed a matrix with definitions to guide coders and reduce subjective interpretation. A subset of documents was coded independently. Then having external researchers review the coding and analysis process to ensure the interpretations align with the data. Finally, the author refined the codes and themes through iterative process, ensuring the reflection of data with DKAP framework.

Fig. 2. Four Basic Phases of Iterative Analysis Process, Morgan & Nica (2020)

4. Findings

4.1. Alignment of Cambodian Education Policies with the DKAP Framework

In Cambodia, implementing DC has been an urgent focus, as the country aims to harness the power of technology to drive social and economic growth. Various policies have been endorsed to empower the next generation to obtain competencies to contribute to developing and integrating Cambodia regionally and globally. This study presents the distribution of DKAP domains embedded in key education policy documents in Cambodia, including Education Law (2007), Masterplan for ICT education (2010), Policy and Strategy on ICT in education (2018), Cambodia's Education 2030 Roadmap, Cambodian ICT Masterplan (2020), Cambodia Secondary Education Blueprint 2030 (2021), EdTech Roadmap (2022), Digital Education Strategy for School (2024), and Digital Media and Information Literacy Competency Framework (2024). This finding can raise awareness of how Cambodian policy underpins the concept of DC, aligned with the regional framework.

The common goal of each relevant policy document outlines the government's endeavor to build students' ICT knowledge and skills to adapt to 21st century employment. Cambodia's MoEYS collaborated with line ministries have acknowledged the significance of technology-enhanced learning ecosystem, focused on improving innovation and entrepreneurship skills. These initiatives guided the Cambodian curriculum framework goals to empower learners, contributing to national and regional development—one core competency emphasis concerned with ICT as a basis for lifelong learning and daily communication. The analysis reveals that the concept of DC is likely addressed in the policies, and various DC competencies are most likely emphasized, particularly ICT and media literacy. However, digital resilience, digital self-awareness, self-regulation, self-motivation, and digital creativity and innovation remain far behind.

Although the related themes have been highlighted, they were not specifically aimed at the competencies concerned with utilizing technology but were fixed on enhancing students' competencies in general. For instance, education law mainly focuses on modernizing teaching and learning to ensure students can engage in society appropriately, ethically, and responsibly. In parallel, The Cambodia's Master Plan for ICT in Education 2009-2013 referenced digital skills and socio-motional competencies for students to thrive in and beyond school while living, learning, and working in rapidly changing, highly digitalized, and interconnected environments. In 2018, the MoEYS set out a policy and strategy for ICT in education committed to integrating ICT in the education system to ensure its efficiency and effectiveness in educational management as well as equip learners with basic computer skills literacy for lifelong learning and soft skills for personal and social interaction. The Cambodia Education Roadmap 2030 also presents its vision to empower the education system for a knowledge society, promoting lifelong learning opportunities for all. Correspondingly, the Cambodian Secondary Education Blueprint 2030 set out its commitment to equip Cambodian youths with subject knowledge, 21st century skills and foreign language skills, good citizenship values, and moral character to enable them to become productive citizens as Cambodia transitions to a knowledge-based economy. In line with digital transformation, the MoEYS envisions empowering schools and all parties to become fully digital citizens, by shaping skills, attitudes, and virtuous character for the digital space.

4.2. How DC Competencies Are Addressed in the Cambodian Upper Secondary Curriculum?

This section identifies all DC-related domains outlined in the DKAP framework within the curriculum. The analysis revealed that the DC concept is obscured in the Cambodian upper secondary curriculum framework, whereas other competencies are addressed. As shown in Table 1, personal data, privacy and reputation, and digital expression were absent from the curriculum, while ICT literacy, digital resilience,

netiquette, digital self-awareness, and digital empathy were the least likely addressed in the subjects. Among the subjects, ICT and social studies (moral civic education) predominantly addressed DC competencies. For example, ICT highlights more cognitive dimensions, and social studies is concerned with socio-emotional factors.

Table 1.

Summary of Cambodian curriculum coverage of DC

DC		**Core Subjects in the Curriculum***									
Domains	**Competencies**	1	2	3	4	5	6	7	8	9	10
1. DL	1.1 ICT Literacy										
	1.2 Information Literacy										
2. DSR	2.1 Understanding Child Rights										
	2.2 Personal Data, Privacy and Reputation										
	2.3 Health and Well-being										
	2.4 Digital Resilience										
3. DPA	3.1 Interacting, Sharing, and Collaboration										
	3.2 Civic Engagement										
	3.3 Netiquette										
4. DEI	4.1 Self-awareness										
	4.2 Self-regulation										
	4.3 Self-motivation										
	4.4 Interpersonal Skills										
	4.5 Empathy										
5. DCI	5.1 Creativity										
	5.2 Expression										

This table is developed by the author.

* Curriculum framework subjects: 1) Khmer Literature; 2) Mathematics; 3) Social Studies (history, geography, moral-civics, and home economics); 4) ICT; 5) Science (physics, earth science, chemistry, and biology); 6) Foreign Languages; 7) Physical Education and Sports; 8) Health Education; 9) Arts Education; and 10) Local Life Skills.

4.3. Do any specific subjects predominantly address DC concepts?

DC concepts are primarily coupled with ICT and social studies, particularly moral civic education. The study showed that DC competencies of the DKAP were more likely to be addressed in both subjects, although the contents did not provide opportunities for students to exercise their DC competencies properly.

ICT in upper secondary education comprises 33 sub-categories of content: Grades 10 (12), 11 (8), and 12 (13). The analysis indicated that in Grade 10, most content highlighted the concept of DC, whereas in Grades 11 and 12, most DC competencies were minimized. ICT literacy, digital interaction, sharing, and collaborative civic engagement were found across all grade levels in the upper secondary curriculum; however, digital personal data, privacy and reputation, digital resilience, digital netiquette, digital interpersonal skills, digital creativity, and expression were only partially addressed, Table 2.

4.3.1 ICT literacy

The curriculum emphasizes the technical aspects of ICT skills required to operate digital devices, applications, and services. It introduces content such as computer software, word processing, communication platform identification, presentation design, spreadsheets, design tools, and functions. The goals of the lesson were:

> "*At the end of the lesson, students are able to describe functions and key components of hardware and software of the computer.*" *(ICT Grade 10, Chapter 1, Unit 1*)

4.3.2 Information literacy

The content encourages students to identify reliable sources of information to be utilized for any purpose.

> *"At the end of the lesson, students are able to analyze the information, knowledge, concept, and wisdom.*" *(ICT Grade 10, Unit 1, Lesson 1*)

4.3.3 Interacting, sharing and collaborating, and civic engagement

The content presents the use of digital technology to circulate information and interact in society. The curriculum also includes the concept of online business, which can benefit either individuals or the society.

> *"At the end of the lesson, students are able to explain the roles and functions of social networks for promoting products and making profits." (ICT Grade 11, Unit 3, Lesson 1)*

4.3.4 Digital personal data, privacy and reputation

Online safety topics, such as signing up and logging in to any domain on the Internet and understanding privacy, are minimally highlighted. This represents a critical gap in the curriculum; however, it lacks an explanation about why secure passwords are essential, such as preventing identity theft or unauthorized access. Furthermore, this topic is emphasized mainly in grade 10.

> *"At the end of the lesson, students are able to diagnose the accuracy of information on the Internet and its safety." (ICT Grade 10, Unit 3, Lesson 1)*

4.3.5 Digital resilience

The content includes an analysis of the accuracy and reliability of the information and its source. This remains less represented because although it emphasizes recognizing how to ensure safety online and avoid online risks, it lacks the context for enhancing flexible skills to overcome unexpected setbacks in the digital environment.

4.3.6 Digital netiquette

The ICT Grade 10 curriculum underlines appropriate behaviors as an important aspect of either offline or online communication. It demonstrates courteous behaviors for interacting with people and the use of polite language, particularly in email communication. The content tends to foster ethical communication in the limited scope of digital platforms; however, the analysis identified a lack of content addressing issues concerning cyberbullying, digital drama, or hate speech, which are growing concerns, and more practical examples of such current matters remain deficient.

4.3.7 Digital interpersonal skills

The curriculum maintains essential content to enhance good online relationships, embrace diversity, and avoid conflicts in digital society, including valuing well-organized and respectful verbal and non-verbal interactions. Guidance is lacking on how to reflect qualities of healthy and rewarding relationships and how such relationships are affected by digital technology.

4.3.8 Digital creativity and expression

This curriculum encourages creativity and innovation. The content illustrates using digital technology to explore new ideas and create content and blogs for self-expression as they align with digital creativity and expression, forming a bridge to reshape critical and creative thinking in digital practice.

The ICT curriculum provides basic content regarding the technical aspects of digital literacy and online participation. However, understanding child rights, digital health and well-being, digital self-awareness, self-regulation, self-motivation, and digital empathy competencies have not been addressed in ICT subjects.

Table 2.

Alignment of Cambodian ICT content in upper secondary curriculum with DKAP

DC		ICT Content		
Domains	**Competencies**	**G10**	**G11**	**G12**
1. DL	1.1 ICT Literacy	_Computer software _Word processing _Communication platforms (social networking and email)	_Presentation design _Spreadsheet	_ICT Network Tools _Design (Graphic, website, webpage) _Program coding
	1.2 Information Literacy	_Effective communication	_Research work	_Media literacy
2. DSR	2.1 Understanding Child Rights			
	2.2 Personal Data, Privacy and Reputation	_Internet and Email safety and privacy		
	2.3 Health and Well-being			
	2.4 Digital resilience	_Internet and Email safety		_Media literacy
3. DPA	3.1 Interacting, Sharing and Collaborating	_Internet and Email Communication (sharing ideas and news)	_Online business	_Online business
	3.2 Civic engagement	_Internet and Email Communication	_Online business	_Online business
	3.3 Netiquette	_Appropriate behaviors with others		
4. DEI	4.1 Self-awareness			
	4.2 Self-regulation			
	4.3 Self-motivation			
	4.4 Interpersonal skills	_Appropriate behaviors with others		
	4.5 Empathy			
5. DCI	5.1 Creativity		_Research work to discover new things	_Content creating and management; Blog
	5.2 Expression			_Content creating and management; Blog

Moral-civics education aims to cultivate in students the values of virtue, humanity (idea, cognitive, consciousness, skill, and morality), sociocultural dimensions, and responsibility for actions and decisions. These subject addresses competencies related to information literacy (critical thinking skills), understanding rights as citizens, civic engagement, digital interpersonal skills, and empathy. Notably, ICT literacy, digital safety and resilience, and digital self-motivation were not highlighted, Table 3. The content specifies ethical conduct and responsible attitudes for positive engagement in society; nevertheless, it lacks specific and practical examples or opportunities for students to apply digital skills in the technological space.

In response to concerns about online child sexual exploitation and violence, the syllabus did not emphasize any content that could help young people avoid and respond to online threats. For example, Grade 11 moral-civics content introduces the topic of self-awareness and building self-confidence to positively contribute to society. Digital self-awareness demands that students realize their online presence plays a significant role. Units 1 and lesson 6 of Grade 10 highlighted forms of violence and their impact but did not elaborate on detailed forms of online exploitation so that young adults could avoid or overcome exposure to risky online activities.

Table 3.

Alignment of Cambodian moral-civics in Upper Secondary Education to DKAP

DC		Moral-Civic Content		
Domains	**Competencies**	**G10**	**G11**	**G12**
1. DL	1.1 ICT Literacy			
	1.2 Information Literacy		- Critical judgement	- Critical thinking
2. DSR	2.1 Understanding Child Rights	- Citizenship and Human rights	- Rights and Freedom	- Principles of Law
	2.2 Personal Data, Privacy and Reputation			
	2.3 Health and Well-being			
	2.4 Digital Resilience			
3. DPA	3.1 Interacting, Sharing and Collaborating			
	3.2 Civic Engagement	- Citizenship - Social engagement	- Solidarity - Citizenship	- Citizenship (Individual, family, and social obligation) - Social accountability
	3.3 Netiquette	- Etiquette and Brahma Vihara (four Buddhist Virtues)	- Arts of Advocacy - Etiquette	- Value and morality
4. DEI	4.1 Self-awareness		- self-awareness	- Leadership
	4.2 Self-regulation	- Self-control		- Leadership
	4.3 Self-motivation			
	4.4 Interpersonal Skills	- Respect oneself and others - Positive communication, peaceful advocacy	- Violence and non-violence identification - Truth and Integrity concept - Professional ethics	- Leadership
	4.5 Empathy	- Etiquette and Brahma Vihara (four Buddhist Virtues) - Respect oneself and others - Peace building	- Truth and Integrity concept	- Respect diversity
5. DCI	5.1 Creativity			- Moral and entrepreneur
	5.2 Expression	- Identity - Consciousness	- National identity	

5. Discussions

To understand how DC is emerging in the Cambodian context, this study examined the curricula and policies and how they align with UNESCO's DKAP framework. As the Cambodian government's initiatives, such as the EdTech Roadmap (2022) and the Digital Skills Development Roadmap in Cambodia (2024), reflect a commitment to integrating digital skills into the curriculum. The analysis

revealed partial alignment between them, while certain elements, such as basic ICT literacy, information literacy, digital interaction, engagement, self-motivation, interpersonal skills, empathy, and creativity, were frequently highlighted in the policy documents and curriculum, specifically among ICT and social studies subject (moral-civic education). However, there remains critical deficiencies in the Cambodian upper secondary education curriculum concerning three essential competencies—digital resilience, digital emotional intelligence, and digital creativity and innovation—which are needed to navigate the complexities of digital society, foster ethical and adaptive behaviors, and empower learners' innovation within a technology-driven world. These findings are consistent with those of previous studies conducted in Cambodia. For example, Keo et al. (2024b) highlighted the barriers (limited digital equipment, infrastructure, digital competence, high costs, and cultural alignment) to technology integration in higher education teaching and learning. Such challenges and limited access have hindered opportunities to leverage digital literacy to foster students' creativity and innovation. The results can clearly reflect how restricted the policies translate into practice. The curriculum itself also remains irrelevant and imbalance since most concepts bear primarily in ICT and moral-civic education. Then the following discussion of why the underrepresented competencies are significant and why they are not specified due to some contextual issues can have extensive consequences for key stakeholders to well-prepare when integrating them into the system.

5.1. Why Do the Underrepresented Competencies Matter?

The rise of new technologies, transformative innovations, and the growing complexity of data and customer interactions have led to a need for a fresh set of skills that surpass mere technical expertise. However, the underrepresented competencies - digital resilience, emotional intelligence, and creativity and innovation - frequently neglected in favor of measurable technical abilities, are increasingly recognized as vital for success in today's technology-driven landscape.

5.1.1 Digital Resilience (DR)

Digital resilience is crucial for empowering young people to navigate risky digital situations (Khan et al., 2024; UNESCO, 2023). The underrepresentation of digital resilience in the Cambodian curriculum suggests that students may miss critical skills to effectively mitigate and respond to these risks, which led them more vulnerable in the contemporary society. This gap can hinder personal growth, academic performance, and future employability, particularly as digital risks become increasingly pervasive in educational and workplace settings. Focusing on digital safety, critical thinking, and ethical decision making is essential to align with global best practices in digital citizenship education (Choi et al., 2017).

5.1.2 Digital Emotional Intelligence (DEI)

DEI demonstrates the capacity to recognize, manage, navigate, and express emotions properly in digital interactions (UNESCO, 2019a). Goleman (1996) stated that EQ's key aspects are effective intrapersonal and interpersonal interaction and high performance, and that in online communication, DEI cultivates empathy, ethics, and conflict resolution. Similarly, Segura et al. (2020) showed that DEI enhances students' capabilities to navigate online relationships and minimizes negative behaviors, such as cyberbullying. Its absence from the Cambodian upper secondary education curriculum results in missed opportunities for students' collaborative and inclusive engagement in the digital realm.

5.1.3 Digital Creativity and Innovation (DCI)

DCI involves the capacity to leverage technology to create something new and express one's identity. Koehler et al. (2013) emphasized the value of integrating technological, pedagogical, and content knowledge (TPACK) into education to foster creativity in digital contexts. However, Thy et al. (2023) found that science teachers in Cambodia demonstrated low competency in ICT literacy to support their profession and assist students' learning. Teachers likely preferred traditional teaching methods to ICT-based teaching. The Cambodian curriculum's limited emphasis on this competency could hinder students' creativity and critical thinking skills, disrupting their capacity to contribute to the government's vision for the digital economy and global innovation ecosystems. This gap can be addressed by incorporating

project-based learning, coding, digital design, and other emerging programs into the curriculum to promote innovation and entrepreneurship (Morel & Spector, 2022).

5.2. Why Are They Absent?

The absence of critical digital competencies and a DC framework in Cambodia's upper secondary education curriculum (USEC) has created notable gaps due to interconnected historical, cultural, socioeconomic, and institutional factors.

5.2.1 Policy Gaps

In Cambodia, educational curricula development is shaped by political and cultural factors that emphasize conventional teaching approaches and national identity preservation. From a political perspective, the curricula have been influenced and shaped through centralized control, restricting the flexibility of local and cultural adaptations. Education policy has conventionally focused on enhancing foundational skills and economic development rather than emerging competencies such as digital resilience, digital emotional intelligence, and digital innovation (MoEYS, 2024). Efforts to promote ICT in education have often prioritized infrastructure and digital literacy. However, this deficiency indicates a fragmented approach in preparing students for digital era complexities (UNESCO Institute for Statistics, 2018). Since DC is an emerging endeavor in Cambodia, many Cambodian teachers lack the preparation to teach complex subjects, including empathy, creativity, or digital engagement. Professional development programs emphasize basic technical skills, resulting in gaps in fostering high-level digital competencies. Without structured support, teachers tend to focus on technical rather than soft skills (In-Seong et al., 2022; Sok & Heng, 2024).

5.2.2 Cultural and Societal Norms

Furthermore, this gap is influenced by cultural perspectives, as Cambodia prioritizes harmony and individual expression, which could indicate a limited emphasis on fostering digital creativity (Gong et al., 2023)). Traditional teaching styles in Cambodia are rooted in most teachers' perceptions rather than critical thinking, emotional navigation, and creativity (Thy et al., 2023). The Cambodian educational landscape reflects a robust emphasis on academic achievement, often neglecting the development of emotional intelligence and creativity, which are crucial for holistic personal and educational development, even if the curriculum commits to holistically developing competitive citizens (e.g., collaborative, analytic, and creative skills) (MoEYS, 2016).

5.2.3 Resource Constraints

Sot et al. (2022) claimed that curriculum deficiencies hindered teaching and learning effectiveness. Curriculum development in Cambodia has faced challenges concerning insufficient support and funding for teacher training, barriers from historical legacies, and complexity in education for sustainable development. These findings are consistent with previous studies in Turkey (Yılmaz Özden, 2023; Öztürk, 2021; Szmodis et al., 2015). Limited funding for education often prioritizes immediate needs, such as infrastructure, teacher training, and enrollment, and over-revises and modernizes the curriculum. Additionally, digital inequalities persist, with rural areas often lacking access to reliable Internet and digital devices (MoEYS, 2024). Integrating digital competencies becomes difficult without equitable access to technology because many students and teachers lack the resources to practice and develop these skills (Timotheou et al., 2023).

6. Conclusion and Suggestions

This research highlights the need to harmonize the Cambodian USEC and governmental guidelines with UNESCO's DC framework to equip students with digital competencies. The absence of critical competencies increases Cambodian students' vulnerability to increased risk in the evolving digital world – cybercrimes, cyberbullying, cyber sexual abuse, minimal economic potential, and socio-emotional challenges. Various setbacks have increased underrepresentation, requiring greater efforts for curriculum reform, education stakeholder awareness, and capacity enhancement. This study opens avenues for

integrating cross-disciplinary of DC to urge the acquisition of a broad understanding of effective and ethical digital participation. Identifying well-rounded approaches, teacher training, and topics is worth to encourage effective DC practices in the Cambodian context and others with similar characteristics. Examining the content and policy alignment provides a limited understanding of DC principles integrated into the Cambodian USEC; therefore, evaluating policy implementation and outcomes is mandatory. In terms of contextual constraints, the study encourages government to build collaborative framework, involving diverse stakeholders, particularly EdTech firms, to co-create and invest in curriculum and tools addressing essential DC competencies for students and teachers. The curriculum developers should reinforce the citizenship education, particularly DR, DEI, and DCI competencies, following digital literacy matters, by seeking opportunities to embed DC competencies and concept across subjects. Addressing this area can ensure that the curriculum respect and reflect Cambodian values and social norms while leveraging substantial digital competencies. Further studies should extend these findings to other settings seeking innovative approaches to integrating DC in cross-curricula, and understanding the best practices and challenges faced in bridging gaps between policy and practices. This can lead to developing a framework tailored to unique social, cultural, and economic contexts in other countries.

References

Cain, J. (2018). It's time to confront student mental health issues associated with smartphones and social media. *American Journal of Pharmaceutical Education*, *82*(7), 738–741. https://doi.org/10.5688/AJPE6862

Casadio, P., Rackett, T., & Williams, G. (2021). The future of work, technology and the social market economy in Cambodia. In R. Hör & T. Hesketh (Eds.), *Future of work digital insights* (4th ed., pp. 204–214). Konrad-Adenauer-Stiftung.

Chea, P., BO, C., & Ryuto, M. (2022). *Cambodian secondary school teachers' readiness for online teaching during the Covid-19 pandemic*. CDRI Working Paper Series No. 134. CDRI.

Chen, L. L., Mirpuri, S., Rao, N., & Law, N. (2021). Conceptualization and measurement of digital citizenship across disciplines. *Educational Research Review*, *33*, 100379. https://doi.org/10.1016/j.edurev.2021.100379

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

Copp, J. E., Mumford, E. A., & Taylor, B. G. (2021). Online sexual harassment and cyberbullying in a nationally representative sample of teens: Prevalence, predictors, and consequences. *Journal of Adolescence*, *93*, 202–211. https://doi.org/10.1016/j.adolescence.2021.10.003

Council of Europe. (2019). *Developing and promoting digital citizenship education - Recommendation CM/Rec (2019)10 adopted by the Committee of Ministers of the Council of Europe on 21 November 2020*. 25.

Culminas-Colis, M. V., & Reyes, W. S. (2024). Integrating digital citizenship in social studies. *Journal of Research, Policy & Practice of Teachers & Teacher Education*, *14*(2), 1–14. https://doi.org/10.37134/jrpptte.vol14.2.1.2024

Dash, T., Yem, B., & An, S. (2021). COVID–19, digital transformation, and skills gap among the Cambodian young labor force. In R. Hör & T. Hesketh (Eds.), *Future of work digital insights* (4th ed., pp. 216–225).

Dhamodharan, M., & Sunaina, K. (2023). Cyberbullying: A disturbed psyche and digital abuse in 21st century. In M. Boskovic, G. Misev, & N. Putnik (Eds.), *Analyzing new forms of social disorders in modern virtual environments* (pp. 224–249). https://doi.org/10.4018/978-1-6684-5760-3.ch010

DQ Institute. (2019). *DQ global standards report 2019: Common framework for digital literacy, skills and readiness*. DQ Institute.

Fekih-Romdhane, F., Jahrami, H., Away, R., Trabelsi, K., Pandi-Perumal, S. R., Seeman, M. V., Hallit, S., & Cheour, M. (2023). The relationship between technology addictions and schizotypal traits: Mediating roles of depression, anxiety, and stress. *BMC Psychiatry*, *23*(1), Article 67. https://doi.org/10.1186/s12888-023-04563-9

Fernández-Prados, J. S., Lozano-Díaz, A., & Ainz-Galende, A. (2021). Measuring digital citizenship: A comparative analysis. *Informatics*, *8*(1), Article 18. https://doi.org/10.3390/informatics8010018

Flores, E. P., & Mean, U. (2024). Digital transformation in Cambodian higher education and its impact on teaching and learning outcomes. *Journal of Accounting, Finance, Economics, and Social Sciences*, *9*(1), 23–34. https://doi.org/10.62458/jafess9(1)3

Funk, A., Vesteinsson, K., & Baker, G. (2024). *Freedom on the net: The struggle for trust online*. https://freedomhouse.org/report/freedom-net/2024/struggle-trust-online

Giannoutsou, N., Ioannou, A., Timotheou, S., Miliou, O., Dimitriadis, Y., Cachia, R., Villagrá-Sobrino, & Martínez-Monés, A. (2024). *Unpacking the impact of digital technologies in education: Literature review and assessment framework*. Publications Office of the European Union. https://doi.org/10.2760/214675

Goleman, D. (1996). *Emotional intelligence: Why it can matter more than IQ*. Bantam Books.

Gong, Z., Wang, M., Nanjappan, V., Georgiev, G.V. (2023). Effects of Digital Technologies on Cultural Factors in Creativity Enhancement. In: Chakrabarti, A., Singh, V. (eds) Design in the Era of Industry 4.0, Volume 3. ICORD 2023. Smart Innovation, Systems and Technologies, vol 346. Springer, Singapore. https://doi.org/10.1007/978-981-99-0428-0_32

Gottschalk, F. (2019). Impacts of technology use on children: Exploring literature on the brain, cognition and well-being. *OECD Education Working Paper No. 195*. https://one.oecd.org/document/EDU/WKP%282019%293/En/pdf

In-Seong, J., Sang-Mok, J., & Ki-Sang, S. (2022). Design and development of ICT major curriculum for pre-service teacher in developing countries: Focused on Cambodia. *Edutainment Research*, *4*(2), 121–137. https://doi.org/10.36237/koedus.4.2.121

James, C., Weinstein, E., & Mendoza, K. (2021). Teaching digital citizens in today's world: Research and insights behind the commonsense K-12 digital citizenship curriculum. Common Sense Media. https://openlab.bmcc.cuny.edu/edu-210-b18l-fall-2023-j-longley/wp-content/uploads/sites/3085/2023/04/common_sense_education_digital_citizenship_research_backgrounder-2-copy.pdf

Jones, L. M., & Mitchell, K. J. (2016). Defining and measuring youth digital citizenship. *New Media & Society*, *18*(9), 2063–2079. https://doi.org/10.1177/1461444815577797

Keo, V., Sam, R., Lan, B., & Rouet, W. (2024). Challenges and opportunities of educational technology integration in Cambodian higher education institutions: A literature review. *International Journal of Education, Psychology and Counselling (IJEPC)*, *9*(54). https://gaexcellence.com/ijepc/article/view/285

Khan, S. K., Sohail, A., & Kashif, M. F. (2024). Toward Digital Resilience: Strategies for Promoting Positive Mental Health in the Age of Social Media. Global Management Sciences Review, IX(I), 12-23. https://doi.org/10.31703/gmsr.2024(IX-I).02

Kim, M., & Choi, D. (2018). Development of youth Digital Citizenship Scale and implication for educational setting. *Educational Technology & Society*, *21*(1), 155–171.

Koehler, M. J., Mishra, P., & Cain, W. (2013). What is technological pedagogical content knowledge (TPACK)? *Journal of Education, 193*(3), 13–19. https://doi.org/10.1177/002205741319300303

Komar Rikreay Association. (2021). *The impact of COVID-19 on child protection and well-being*.

Lim, M. (2023). Media literacy education in Cambodia: What, why, how. In K. Heng, K. Sol, S. Kaing, & S. Em (Eds.), *Innovations and challenges in Cambodian education: Youth's perspectives* (pp. 131–144). Cambodian Education Forum. http://dx.doi.org/10.62037/cef.book.2023.09.05

Mattson, K., & Curran, M. B. (2019). Digital citizenship education: Moving beyond personal responsibility. In B. S. De Abreu, P. Mihailidis, A. Y. Lee, J. Melki, & J. McDougall (Eds.), *International Handbook of Media Literacy Education* (pp. 144–155). Routledge. https://doi.org/10.4324/9781315628110-13

Meates, J. (2020). Problematic digital technology use of children and adolescents: Psychological impact. *Teachers and Curriculum*, *20*(1), 51–62. https://doi.org/10.15663/tandc.v20i1.349

Ministry of Post and Telecommunications. (2023). *Cambodia Child Online Protection Guideline for the Digital Technology Industry*. https://www.unicef.org/cambodia/media/7751/file/Cambodian%20Child%20Online%20Protection%20Guidelines.pdf

MoEYS. (2015). *Curriculum framework for general education and technical education*.

MoEYS. (2016). *Curriculum framework for general education and technical education*.

MoEYS. (2019). *Cambodia education roadmap 2030*.

MoEYS. (2024). *Education strategic plan 2024-2028* (Issue June).

Morel, G. M., & Spector, J. M. (2022). *Foundations of educational technology: Integrative approaches and interdisciplinary perspectives*. Routledge.

Morgan, DL, & Nica, A. (2020). Iterative thematic inquiry: A new method for analyzing qualitative data. International journal of qualitative methods, 19, 1609406920955118.

Nizariah, S. (2021). The impact of technology on adolescent social change: A case study on the use of social media. *Proceedings of the 2nd International Conference on Science, Technology, and Modern Society (ICSTMS 2020)*, *576*, 500–502. https://doi.org/10.2991/assehr.k.210909.106

OECD. (2018). *An OECD learning framework 2030*. In G. Bast, E. G. Carayannis, D. F. J. Campbell (Eds.), *The future of education and labor. Arts, research, innovation and society.* Springer. https://doi.org/10.1007/978-3-030-26068-2_3

OECD. (2020). What students learn matters: Towards a 21st century curriculum. OECD Publishing. https://doi.org/10.1787/d86d4d9a-en

OECD. (2023). *OECD digital education outlook 2023: Towards an effective digital education ecosystem*. OECD Publishing. https://doi.org/10.1787/c74f03de-en

OECD. (2024a). *Curriculum flexibility and autonomy: Promoting a thriving learning environment*. OECD Publishing. https://doi.org/10.1787/eccbbac2-en

OECD. (2024b). *Managing screen time: How to protect and equip students against distraction. Programme for International Student Assessment*. OECD Publishing. https://www.oecd.org/content/dam/oecd/en/publications/reports/2024/05/managing-screen-time_023f2390/7c225af4-en.pdf

Öztürk, G. (2021). Digital citizenship and its teaching: A literature review. Journal of Educational Technology & Online Learning, 4(1), 31-45.

Pang, S., Nhor, R., & Em, S. (2022). Cambodian teachers' readiness of using ICT: The case of rural upper-secondary schools. *Jurnal As-Salam*, *6*(2), 145–162. https://doi.org/10.37249/assalam.v6i2.432

Ribble, M., & Bailey, G. D. (2007). *Digital citizenship in schools*. International Society for Technology in Education.

Ribble, M., & Park, M. (2019). *The digital citizenship handbook for school leaders: Fostering positive interactions online*. International Society for Technology in Education.

Segura, L., Estévez, J. F., & Estévez, E. (2020). Empathy and emotional intelligence in adolescent cyber aggressors and cyber victims. *International Journal of Environmental Research and Public Health*, *17*(13), Article 4681. https://doi.org/10.3390/ijerph17134681

Slaughter, A., & Newman, E. (2022). New frontiers: Moving beyond cyberbullying to define online harassment. *Journal of Online Trust and Safety*, *1*(2), 1–25. https://doi.org/10.54501/jots.v1i2.5

Sok, S., & Heng, K. (2024). Research on teacher education and implications for improving the quality of teacher education in Cambodia. *International Journal of Professional Development, Learners and Learning*, *6*(1), ep2401. https://doi.org/10.30935/ijpdll/14042

Sot, V., Chey, C., & Chhinh, S. (2022). *The teaching profession in Cambodia: Progress to date and ongoing needs*. In 10.1007/978-981-16-8213-1_7.Supreme National Economic Council. (2021). Cambodia Digital Economy and Society Policy Framework 2021-2035. Royal Government of Cambodia. https://itd.mef.gov.kh/sharing category/digital/%0Ahttps://itd.mef.gov.kh/assets/uploads/2021/08/Digital-Economy-and-Society-Framework-EN.pdf

Szmodis, W., Russell, M., & Bodzin, A. M. (2015). Using local contexts for learning: The Caring for Cambodia approach. In S. Stratton, R. Hagevik, A. Feldman, & M. Bloom (Eds.), *Educating science teachers for sustainability* (pp. 363–379). Springer. https://doi.org/10.1007/978-3-319-16411-3_19

Thy, S., Im, R., & Iwayama, T. (2023). Examining Cambodian high school science teachers' perception of Technological Pedagogical Content Knowledge (TPACK). *Journal of Science and Education (JSE)*, *4*(1), 1–13. https://doi.org/10.56003/jse.v4i1.232

Timotheou, S., Miliou, O., Dimitriadis, Y., Sobrino, S. V., Giannoutsou, N., Cachia, R., Monés, A. M., & Ioannou, A. (2023). Impacts of digital technologies on education and factors influencing schools' digital capacity and transformation: A literature review. In *Education and Information Technologies, 28*(6), 6695–6726. https://doi.org/10.1007/s10639-022-11431-8

UNESCO. (2019). *Digital Kids Asia-Pacific: Insights into children's digital citizenship*. UNESCO Office Bangkok and Regional Bureau for Education in Asia and the Pacific. https://unesdoc.unesco.org/ark:/48223/pf0000367985

UNESCO. (2022). *Bangkok statement 2022: Towards an effective learning recovery for all and transforming education in Asia-Pacific*. UNESCO Office Bangkok and Regional Bureau for Education in Asia and the Pacific. https://unesdoc.unesco.org/ark:/48223/pf0000381962

UNESCO. (2023). *Digital citizenship in Asia-Pacific: Translating competencies for teacher innovation and student resilience*. UNESCO Office Bangkok and Regional Bureau for Education in Asia and the Pacific. https://unesdoc.unesco.org/ark:/48223/pf0000385426

UNESCO Institute for Statistics. (2018). A global framework of reference on digital literacy skills for indicator 4.4.2. *UNESCO Institute for Statistics,* 51. https://uis.unesco.org/sites/default/files/documents/ip51-global-framework-reference-digital-literacy-skills-2018-en.pdf

UNICEF. (2021). *Digital literacy in education systems: Key insights and opinions of young people*. UNICEF East Asia and Pacific Regional Office. https://www.unicef.org/eap/media/7766/file/Digital%20Literacy%20in%20Education%20Systems%20Across%20ASEAN%20Cover.pdf

UNICEF. (2022). *Disrupting harm in Cambodia*. https://www.unicef.org/innocenti/media/4136/file/DH-Cambodia-Report-2022.pdf

Vuorikari, R., Kluzer, S., & Punie, Y. (2022). *DigComp 2.2, The Digital Competence framework for citizens – with new examples of knowledge, skills and attitudes*. Publications Office of the European Union. https://data.europa.eu/doi/10.2760/115376

Yılmaz Özden, Ş. (2023). Investigating the relationship between digital instructional material development self-efficacy, digital literacy and critical thinking disposition. Journal of Educational Technology & Online Learning, 6(4), 911-92