DIGITAL KIDS ASIA-PACIFIC

INSIGHTS INTO THE DIGITAL LIVES OF CHILDREN

National Report
Lao PDR

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Message

Dear prospect readers,

The Southeast Asia Minister of Education's Organization Regional Centre for Community Education Development (SEAMEO CED) is proud to present this research report to the readers. Like in other countries, use of digital devices and internet is gaining increasing popularity among users, particularly the young generations in Laos. However, little evidence on digital literacy and competency among Lao adolescents is still lacking. This research report aims to shed some lights on digital literacy, and digital citizenship among 15-year old Lao students. The country report is the product of a research project of SEAMEO CED in collaboration with Southeast Asia Minister of Education's Organization Secretariat (SEAMES) and the United Nations' Educational, Scientific and Cultural Organization (UNESCO) in Bangkok.

It is a privilege for SEAMEO CED to participate in this vital project. We, SEAMEO CED, hope that the findings will be useful for education policymaker and practitioners for policy making, planning and implementation to improve use of digital devices among adolescents in the Lao PDR.

On behalf of SEAMEO CED and myself, I would like to express my gratitude to UNESCO Bangkok and Korean Fund-in-Trust for providing technical and financial supports to make this research project happen.

Assoc. Prof. Dr. Niane Sivongxay
Centre Director

Foreword

We are living in digital age. Digital technologies play a significant role in improving our lives and well-being. They are powerful tools for education, and career development.

Like other emerging economies, use of digital technologies is rapidly expanding in the Lao PDR, thanks to strong economic growth in the last decades. However, access to digital devices and the internet is confined to a small percentage of the Lao population living in urban areas. A significant percentage of the population in rural areas could not access to the technologies due to a lack of infrastructure.

Use of digital devices can cause negative effects on the users if they do not have adequate understanding and capability to handle them in proper manners. Although use of digital technologies and internet is gaining popularity among Lao users, research to determine the literacy and competency levels of the users in Laos is still lacking. The research report is expected to provide some insights to bridge the knowledge gab on digital literacy among Lao adolescents.

Hopefully, the information will be useful for education policymakers and educators in making proper interventions to ensure use of digital devices and internet in a safe and useful manner.

Acknowledgements

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Abbreviations and Acronyms

CFA	Confirmatory Factor Analysis
CFI	Comparative Fit Index
CI	Confidence Interval
DKAP	Digital Kids Asia-Pacific
NRT	National Research Team
RMSEA	Root Mean Square Error of Approximation
SD	Standard Deviation
SDG	Sustainable Development Goal
SDG 4	Sustainable Development Goal 4
SEM	Structural Equation Modeling
TLI	Tucker-Lewis Index
UN	United Nations
UNESCO	United Nations Educational, Scientific and Cultural Organization

Executive Summary

The Digital Kids in Asia Pacific (DKAP) Country Report of the Lao PDR is a product of the research study conducted by the Southeast Asian Minister of Education (SEAMEO) Regional Centre for Community Education Development under the Ministry of Education and Sports (MoES). The Country Report has been prepared in collaboration with a Research Team from the Philippine Normal University (PNU), Philippines.

The main objective of the research project is to provide evidence-based information regarding the state of digital citizenship among 15 year-old students in Lao PDR. The five (5) competency domains based on an initial study by the United Nations Educational, Scientific and Cultural Organization (UNESCO) in 2019 are used as bases of the study. These domains include: digital literacy, digital safety and resilience, digital participation and agency, digital emotional intelligence, and digital creativity and innovation. For the Lao PDR context, the main objectives of the research are to determine the following: 1) Is the reliability and validity of DKAP appropriate for Lao students?; 2) How may we describe the digital citizenship among 15-year old Lao students?; 3) Are there differences in the Lao students' digital citizenship competence due to gender?; and, 4) Are there individual and contextual characteristics that predict Lao students' digital citizenship competency?

A quantitative research design using survey methodology was used in this study. It utilized the self-report questionnaire originally developed for the DKAP survey by UNESCO in 2019. It consists of 104 items that measure the five (5) DKAP domains and their corresponding sub-competencies. The survey questionnaire was translated into Lao using the back translation method. After pilot testing the questionnaire and conducting training with the enumerators, the survey was conducted in nine purposively selected public schools. A total of 1,288 Lao students aged 15 years old participated in the survey.

The major findings of the research reveal that the respondents from Lao are most confident in the domain Digital Safety and Resilience (M=3.28) but are least confident in the domain Digital Creativity and Innovation (M=2.79). In general, the Filipino respondents' mean scores in all digital citizenship domains are above the midpoint value, except for Digital Creativity and Innovation.

Results showed that the student respondents from Lao have personal and contextual characteristics that affect their digital citizenship competency. Primarily, the results indicate that while girls have significantly higher mean scores in the Digital Safety and Resilience domain, boys have significantly higher mean scores in both Digital Emotional Intelligence and Digital Creativity and Innovation. Further, multiple regression analysis indicates the following results:

(1) students who reported to have learned coding skills are more likely to have higher scores in the Digital Participation and Agency domain compared to those who reported not to have learned coding skills; (2) students who learned how to develop web or application are more likely to have higher scores in the Digital Safety and Resilience and Digital Creativity and Innovation domains compared to those who reported not to have learned how to develop web or applications; (3) the educational level of students' parents is not associated with students' scores in any domain; and (4) the number of books at the students' homes is associated with higher Digital Literacy scores.

The domain-specific results reveal that in the Digital Literacy domain, the children from the Lao are more confident in their ICT literacy (M=3.28) which is greater than their information literacy (M=3.08). Results in the domain of Digital Safety and Resilience suggest that the respondents are most confident in Personal data, Privacy, and Reputation (M=3.44) and least confident in Promoting and Protecting Health and Well-Being (3.07). The results for the domain of Digital Participation and Agency show that among its three sub-competencies, respondents from Lao are most confident in Interacting, Sharing, and Collaborating (M=3.42). On the other hand, the least mean score gathered is on Civic Engagement (M=2.60). For the domain of Emotional Intelligence, Self-Motivation showed the highest average mean score (M=3.19). In contrast, Empathy is revealed to be the lowest among the sub-competencies (M=2.82). For the Digital Creativity and Innovation domain, respondents are more confident in their Expression (M=2.89) rather than in their Creative Literacy and (M=2.66).

Additional survey results reveal that digital divides exist among the respondents in Lao. These results are revealed by the percentage of students who reported not having access to any digital device at home (6.0), the percentage of students who have never used a digital device or have used a device for less than a year (15.7), and the percentage of students who hardly ever used the Internet or computers for school study (19.2).

The results on the respondents' use of digital technologies provided evidence on the important role of teachers as indicated by the percentage of students who reported that they learned how to use computers mainly from teachers (49.5), the percentage of students who reported that they were frequently (i.e. often, very often, or all the time) guided by teachers in using the Internet safely (30.4), and the percentage of students who reported getting encouragement from their teachers in learning new things using the Internet frequently (39.0).

Based on the results of the survey, the following conclusions can be inferred: (1) it is important to be cognizant of the importance of digital citizenship education at the basic education level, (2) the translated DKAP survey questionnaire may be further validated and modified, (3) there is a fundamentally unequal access to ICT-related devices and Internet connectivity among the Lao students which hampered opportunities for learning, and (4) digital citizenship competencies are shaped by multiple stakeholders.

The following recommendations are offered:

➢ Develop a comprehensive training package for optimal level of digital competence to all teachers and professionals who will be involved in the training and implementation of digital literacy intervention programs for Lao students.

➢ The Ministry of Education and Sports of Lao PDR may consider conducting a benchmarking study with other countries in the ASEAN region to benefit from the best practices and the lessons learned in the effective rollout and implementation of digital literacy programs.

➢ The government of Lao PDR in partnership with universities and other academic institutions in the country may conduct further research to provide evidence that would really reflect the actual realities of the Lao in terms of digital citizenship education.

➢ Policies, enabling mechanisms, and programs should be established to develop digital citizenship skills in all areas with emphasis on empathy, civic engagement, digital creativity, and innovation.

➢ Collaboration between and among the government, industry and private individuals may be enhanced to develop the technological infrastructure for honing the digital citizenship of Lao youth.

To conclude, it can be said that the DKAP framework and survey questionnaire are important developments that provide opportunities for counties or educational systems in the Asia-Pacific region to assess the development of digital citizenship among their students. The data in this study pointed out the different forms of digital inequalities among Lao students and highlight the important role of the government and other educational stakeholders to address the gaps identified. This research has shown not only the data on digital citizenship of Lao students but also opened future strategies for governments to take an active role in strengthening competencies in global citizenship. The DKAP framework can be enriched by developing goals with specific indicators on digital citizenship similar to Sustainable Development Goals or Beijing Platform for Action. These goals with indicators may be used

as metrics and basis for government accomplishment reports. Moreover, the developed goals may also be transformed into standards for quality assurance system of schools or of government units. It is critical for Lao and other countries to continue to examine and expound on the DKAP concepts as digital citizenship competencies are critical for individuals and societies to be successful in a technology-driven world.

Chapter 1: Introduction

1.1.   Background

ICT and Education: The Lao Context

The world has been undergoing rapid transformation over the last few decades due to the development and application of advanced information and communication technology in various aspects such as the economy and education. This changing landscape was further accelerated due to the COVID-19 pandemic. ICT is now playing a crucial role in sustaining and growing the sectors: industries, banking, business, education, and the governments to continue in providing basic services to the people. Over 90% of jobs in the world demand a digital component, thus digital literacy is now a requirement for employees and workers rather than auxiliary skills.

According to Djalal (2020), robust connectivity infrastructure can mitigate more than half of the negative impact of the pandemic in the ASEAN region. He further asserts that "Regarding digitalization, we need to have more digital literacy, digital access and digital infrastructure. If we get these things right, we can actually achieve the vision of having emancipation of education. The most important thing would be the harmonization of regulation among the 10 ASEAN countries, whatever vision we have to digitize ASEAN, the key challenge will always be in the regulation. Once we sort this out, we can make progress by leaps and bounds." (Huawei, 2020)

With the COVID-19 pandemic, almost all the countries around the world had shifted their education delivery from face-to-face learning to remote (online) learning in order to avoid the risk of contracting the virus and maintain the health of the students, teachers and other school personnel.

The Government decided to close the schools and businesses and later they imposed total lockdown. Thus, the educational institutions in Laos grappled the challenge of learning and mastering the new digital landscape of education. In order to continue the education, distance learning was put in place through blended and other modalities like non-digital platforms. Pursuant to the Lao PDR Education COVID-19 Response Plan (2020), the report emphasized the support of stakeholders in preventing the transmission and spread of COVID-19 and ensuring the continuity of learning by providing sound implementation of key learning activities and safe/inclusive reopening of classes. With the reopening of schools in Laos at the second half of 2020, educational institutions operated in shifting schedules practicing social distancing regulations (UNICEF, 2020). UNICEF supported the monitoring of students and staff's health as well as establishing protocols for clean and school disinfection.

Given the natural disasters experienced that damaged school facilities and resources and the limited access of rural communities to national television and internet and electricity, a mix of interventions has been placed to meet the learning demands of students, including those vulnerable and disadvantaged. Interventions include the use of print and non-print (TV, radio and online platforms) resources to support continuity of learning. The Ministry of Education and Sports (MoES) instantly dedicated an educational TV channel and created various educational programs (Karki, 2020). Further, Britto (2020) of UNICEF Laos said that "We have put efforts into using innovations to improve learning outcomes. In this regard, we are providing support to the Government to set up a digital teaching and learning online platform for students and teachers that will bridge the digital divide and will help more children in Lao PDR with remote learning," (Karki, 2020).

Because of these, the students must acquire the necessary digital skills they need to grab and take full advantage of the opportunities being provided by the digital economy in the midst of the pandemic and globalization.

Roadblocks in migration to Digital Learning

According to Pe (2020), referring to the latest UNICEF survey of more than 8,000 ASEAN children and youth on technology and education last August to September 2020, they found out that "high costs, poor infrastructure, and limited information are the main challenges that ASEAN children and youth face, when acquiring digital skills and literacy (ASEAN, 2020)."

One of the challenges that Lao is facing is the unequal access to technology in terms of gender. Although there is increasing access to information and communication technology over the years which levels the playing field, reports still provide data that girls and women often have less access to Internet use compared to boys and men (Aide et Action Southeast Asia, 2019 & Yap, 2020).

Cognizant of the crucial digital skills among the people of Southeast Asian region, the ASEAN Digital Skills Taskforce commits "on developing the human capital pool in ASEAN to ensure that citizens have the skills needed to thrive as digital disruption creates both risks and opportunities for workers (World Economic Forum, 2020)." Some of the activities to close the skills gap are to offer 2,000 internship opportunities for ASEAN university students, contribute to shaping the curricula at 20 ASEAN universities, and to train 40 million ASEAN individual citizens in digital literacy and online safety. In this way, the roadblocks to digital training as well as digital divide are partly addressed.

Internet Use in Lao

With the initiatives of the Lao Ministry of Education and Sports, pursuant to the Education Sector Development Plan 2016-2020 (2015), they envisioned that by 2030, the use of ICT and other means of emerging communication platforms as tools for improving the quality of education will be in place. Supporting this initiative is the allocation of budget gradually in the education and sports sector of Laos.

According to the report of We Are Social and Hootsuite (2020), "79% of the population in Laos now has a mobile phone, with Internet penetration standing at 43% of the population." The use of social media in Laos is directly correlated with the rate of Internet penetration (43%). The number of people who are actively using social media have increased by 12% within 2019 and 2020 which is translated to 3.10 million active social media users or approximately 43% of the country's total population. The 12% increase in the use of social media is caused by those who are using their mobile phones to access social media or the Internet. The number of mobile phone connections have increased by 1.3% between the years 2019 and 2020 while there was an increase of 6.5% in the number of people who are using the Internet. The average Internet speed is 25.54 Mbps.

In Laos, Facebook is the dominant social media platform with its "advertising purportedly reaches 56% of the population, rising by 7.4% in the last quarter. The platform was accessed via mobile phone by 99.6% of the population, with only 0.4% of the population accessing the social media platform by desktop or laptop computer. 6.3% of users accessed Facebook via both phones and computers, with 93.3% accessing Facebook via mobile phone only" (We Are Social and Hootsuite, 2020).

Further, according to the We Are Social and Hootsuite report (2020), Laos has approximately "5.68 million mobile phone connections, with 96% of connections under a pre-paid model. Of these, 66% of mobile connections are broadband (3G-5G). Laos scores 43.93 out of 100 points under the GSMA Mobile Connectivity Index." The GSMA Mobile Connectivity Index measures the performance of 165 countries using key enablers and drivers of mobile internet adoption, including mobile network infrastructure, affordability of devices and services, and ability of relevant content and services (GSMA, 2017).

Digital Citizenship: Domains and Competencies

With the technological advances of today, we look at a bright and secured future on one hand while unrest and conflicts continue on the other hand. Moreover, we are now living in Industry 4.0 which is characterized by "increasing automation and the employment of smart factories informed by data to produce goods more efficiently and productively.

Flexibility is improved so that manufacturers can better meet customer demands using mass customization—ultimately seeking to achieve efficiency with, in many cases, a lot size of one. By collecting more data from the factory floor and combining that with other enterprise operational data, a smart factory enables better decisions to be made" (IBM, 2020). The realities of these technological advancements is best captured by the ideas of leadership gurus, Warren Bennis and Burt Nanus who coined the artificial word, VUCA, which stands for Volatility, Uncertainty, Complexity and Ambiguity. And with the digital transformation keeping up its speed, almost everyone is compelled to develop IT and digital skills.

Additionally, more and more citizens including young people are now digitally connected through mobiles phones, laptops, and tablets. In this post-information world, there are trillions of information in the digital world which could be used by students in their education but this also opens an opportunity for service providers and advertisers to harness the digital footprints of the people. Thus, the challenges and risks of the digital world demand a set of knowledge, skills and competencies for young people for them to effectively navigate this complex world.

In relation to education, different governments around the world are now grappling to address the challenges of migrating the learning modality to online from the traditional face to face learning. This effort entails more investment in strengthening the needed ICT infrastructure and the digital capabilities of schools as well as the teachers and the students. Although some experts are doubtful that the rapid transition to online learning without planning could result in poor student learning, many others assert that a new and emerging modality of education delivery will provide significant benefits for learners. According to Amjad (2020) who used Lark as a learning platform, "It has changed the way of teaching. It enables me to reach out to my students more efficiently and effectively through chat groups, video meetings, voting and also document sharing, especially during this pandemic. My students also find it easier to communicate on Lark. I will stick to Lark even after coronavirus, I believe traditional offline learning and e-learning can go hand by hand."

According to Li and Lalani (2020), it is imperative to enhance the educational program especially the curriculum to include and integrate digital literacy and digital citizenship education for the students. Digital citizenship, according to UNESCO (2016) is "being able to find, access, use and create information effectively; engage with other users and with content in an active, critical, sensitive and ethical manner; and navigate the online and ICT environment safely and responsibly, being aware of one's own rights." Further, the Council of Europe (2020) provides this notion of digital citizenship, "like a frame, and in some ways a filter, that guides the way we use digital technology and behave online. It is about the things we need to know, to do and to be in order to use the internet, mobile phones, apps and other internet-connected devices creatively and responsibly to communicate, explore, work, learn and play online."

With the intent to support the digital literacy and digital citizenship of the young people in Asia Pacific region and the ASEAN countries, UNESCO (2019) conducted a study called Digital Kids Asia-Pacific (DKAP) which aims to understand the state of digital citizenship among ASEAN children. Primarily, the DKAP project investigates five competency domains: digital literacy, digital safety and resilience, digital participation and agency, digital emotional intelligence, and digital creativity and innovation.

UNESCO Bangkok, through a series of meetings and consultation, was able to develop and refine the five (5) domains of DKAP Competency Framework which are the following: Digital Literacy; Digital Safety and Resilience; Digital Participation and Agency; Digital Emotional Intelligence; and Creative and Innovation. Table 1 provides an overview of the five domains and the corresponding competencies:

Table 1
The DKAP Domains and Specific Competencies

Domains	Competencies	
Digital Literacy	1.1	**ICT Literacy:** The ability to manage and operate ICT hardware and software responsibly in digital environments to access and search for data, information and content, and to utilize them
	1.2	**Information Literacy**: The ability to seek, critically evaluate and use digital information effectively to make informed decisions.
Digital Safety & Resilience	2.1	**Understanding Child Rights**: The ability to understand legal rights and obligations within the global and local context
	2.2	**Personal Data, Privacy and Reputation:** The ability to understand how to use and share personally identifiable information while being able to protect oneself and others from harm. Be able to implement strategies for information and device security and personal security protocols.
	2.3	**Promoting and Protecting Health and Well-Being:** The ability to identify and manage health risks, and use digital technology in order to protect and improve the physical and psychological well-being of oneself and others
	2.4	**Digital Resilience:** The ability of being preventative, reactive and transformative that allows young people to avoid or cope with risky situations they face and improve themselves.

Domains	Competencies	
Digital Participation & Agency	3.1	**Interacting, Sharing and collaborating**: The ability to interact, share data and information, and collaborate with others using suitable digital technologies to achieve shared goals (work, social, leveraging network, education, entertainment, etc.).
	3.2	**Civic Engagement:** The ability and willingness to recognize, seek, and act on opportunities to positively influence local and global communities online and/or offline through appropriate digital technologies.
	3.3	**Netiquette:** The ability to demonstrate ethical and courteous behavior to inform choices in interacting and engaging in different digital environments with different audiences.
Digital Emotional Intelligence	4.1	**Self-Awareness**: The ability to explain one's moods, emotions, drives, and how these affect oneself and others in the digital world through introspection.
	4.2	**Self-Regulation:** The ability to manage one's emotions, moods and impulses during online engagements
	4.3	**Self-Motivation:** The ability to demonstrate initiative, commitment to attain internal or external goals despite setbacks in the digital sphere.
	4.4	**Interpersonal Skills:** The ability to build positive online relationships to communicate, build rapport and trust, embrace diversities, manage conflicts and make sound decisions.
	4.5	**Empathy:** The ability to demonstrate awareness and compassion for the feelings, needs and concerns of others during digital interactions
Creativity & Innovation	5.1	**Creative Literacy**: The ability to apply skills and use tools to create/ adapt/or curate digital content
	5.2	**Expression:** The ability to use technology to represent or express creatively children's identities

The UNESCO digital citizenship education framework may serve as the national guide of Laos in developing its national education curriculum as well as programs and projects on digital literacy.

This DKAP project provides relevant empirical evidence as an input in developing education programs and policy in the area of digital literacy and digital citizenship for the Ministry of Education and Sports in Laos so that the young people today will be able to adapt and respond to the challenges of the digital world.

1.2.   Overall Objectives of the Research

Objectives of the Project

Since 2014, UNESCO Bangkok has implemented the "Fostering Digital Citizenship through Safe and Responsible Use of ICT" Project. The overall goal of this project is to promote and sustain policy dialogue in the Asia-Pacific on the issues of the safe, effective, and responsible use of ICT and to build the education sector's capacity to foster digital citizenship among students.

As part of the Project, the "Digital Kids Asia Pacific (DKAP)" project component seeks to conduct a comparative cross-national study to address the Asia-Pacific region's knowledge gap regarding student's ICT practices, attitudes, behaviors, and competency levels within an educational context. Specifically, the objectives of the DKAP project are to:

- Contribute to the evidence-base 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.

- Establish an evidence-based understanding of 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 expected output of this project is a comparative cross-national study that:

- Sets out a reliable and comprehensive baseline in Asia-Pacific countries of children's actual attitude, behaviors, competency levels, and use of ICT within an educational context that will inform relevant education policies and practices.

- Assesses whether the framework's domains and competencies are valid, based on the data gathered from pilot countries, for measuring children's attitudes and behaviors, competency levels, and use of ICT within an educational context.

The DKAP survey was initiated and conducted in 2019 in four Asia-Pacific countries, namely: Bangladesh, Fiji, Republic of Korea, and Vietnam. The results and recommendations

provide initial data on the digital citizenship of students in the four participating countries. This DKAP survey in Laos is another contributory set of data that will provide a bigger picture of digital literacy and digital citizenship competency among students in the Asia-Pacific as well as in the ASEAN region.

Research Questions

The overall research question in the DKAP project is: "Is DKAP measuring the 'digital citizenship competency' of Asia Pacific students?" For the present research, the research question is: "Is DKAP measuring the 'digital citizenship competency' of Lao students?"

To answer these questions, more specific sub-research questions are established for the present research:

1. Is the reliability and validity of DKAP appropriate for Lao students?
2. How may we describe the digital citizenship competency of 15-year-old Lao students?
3. Are there any differences in the Lao students' digital citizenship competency due to gender?
4. Are there individual and contextual characteristics that predict Lao students' digital citizenship   competency?

Chapter 2: Methodology of the Research

2.1. Nature of the Research

Survey

The present research adopted a quantitative research design using survey. The research utilized the self-report questionnaire developed for the DKAP survey given by the UNESCO Bangkok (UNESCO, 2019). The survey consists of 104 items that measure digital citizenship competencies and other relevant information. The questionnaire has eight (8) sections and the primary items refer to the items designed to measure the five DKAP domains and their corresponding competencies.

The survey questionnaire adopts a four-point Likert scale format. The full questionnaire (English) is in Annex 1. The number of items per component are as follow: (A) Digital Literacy = 14 items; (B) Digital Safety and Resilience = 18 items; (C) Digital Participation and Agency = 12 items; (D) Digital Emotional Intelligence = 16 items; (E) Digital Creativity and Innovation = 11 items; (F) Student Background = 8 items; (G) Access to and usage of digital devices = 18 items; and (H) Socio-economic status = 7 items.

The questionnaire was translated from English to Lao by the National Research Team (NRT) using the back translation method. The translated DKAP survey tool was piloted in a school in an urban area in Vientiane with a total number of 50 participants. The results of the pilot survey were analyzed and the results indicated that the participants could answer the questions very well and no revision was made on the translated questionnaire.

Sampling and Participants

The schools were identified based on geographical division of Laos: the north, the central and the south to ensure representation. Luang Prabang represented the north, Vientiene the central and Savannakhet the south. The target schools were selected through purposive sampling based on consultations with the Provincial Department of Education and Sports. All participating schools are public schools. In each province, one school is located in an urban area, one semi-urban, and one remote area. In total, nine schools participated in the survey. There were three participating schools from each province, representing urban, semi-urban, and remote areas.

The data collection teams were grouped into three teams with three members each, with one team for each geographical division. A total of 1,288 Lao students aged 15 years old participated in the survey. Of the 1, 282 students who reported their gender, 54.60% (N= 700) are girls.

Data Collection

A two-day data collection training was organized for nine enumerators. The background of the research project was discussed with the enumerators. During data collection, the paper-based questionnaires were distributed to students in their respective classes. Each student spent between 40-50 minutes to complete the questionnaire. The students' responses in the completed questionnaires were encoded and organized into the Excel file. Coding of student responses on the questionnaire followed the code book provided by UNESCO Bangkok.

2.2.   Reliability and Validity of Survey

One of the purposes of the present research is to determine if the DKAP survey questionnaire is reliable and valid. Data from the sample of Lao participants who responded to the online survey was then examined to establish the reliability and validity of the questionnaire used.

Cronbach's alpha was obtained to determine the internal consistency of each domain and the sub-competencies within each domain. Annex 2 presents the results of the internal consistency reliability analysis. The Cronbach's alpha values for the domains range from .68 .80 which are indicative of acceptable to good internal consistency. However, the Cronbach's alpha values for the sub-competencies range from .39 to .75 which suggests that some subscales have poor internal consistency as some have below .50 (Kline, 2020). Overall, the internal consistency of the DKAP survey is acceptable in the scale level but not in the subscale level. Results relating to the subscales with low internal consistency should be interpreted with caution.

To assess the validity of the measurement model of the DKAP survey, confirmatory factor analysis (CFA) using structural equation modelling (SEM) was performed on the survey data. CFA was performed for each of the five competency domains with sub-competencies as latent variables and their corresponding items as observed variables. Overall, CFA results indicate that all five domains have adequate model fit, although the fit indices obtained are lower than most standards set for model fit. For all domains, all items loaded significantly on their hypothesized latent factor (sub-competency) with standardized parameter estimates ranging from .200 to .732. Moreover, many of the standardized parameter estimates were all above .50. Overall, the CFA results provided some support to the validity of the DKAP survey.

The CFA results are presented in Annex 3.

2.3. Data Analysis

The responses of the sampled Lao students to the translated DKAP survey were analyzed by determining frequency, percentage scores, mean scores, and standard deviations to describe the digital citizenship competency of the participants in terms of the DKAP domains and sub-competencies. Whenever applicable, responses in certain items were reverse-coded. Missing values were addressed using listwise deletion.

A series of independent sample t-test were conducted to determine if there are differences in the participants' digital citizenship competency domains as a function of gender (girl/boy). A series of multiple regression analyses were performed to determine if a set of personal and contextual factors predict each of the domains. The factors that were hypothesized as predictors were mostly adopted from the ones used in the previous survey (UNESCO, 2019). For the present research, these factors are: (1) gender, (2) duration of use of digital devices, (3) frequency of use of digital devices, (4) coding skills learning experience, (5) web or application development experience, (6) parents' education level, and (7) number of books at home. To account for shared variance, all hypothesized predictor variables were entered in the multiple regression model simultaneously.

2.4. Ethical Considerations, Limitations, and Challenges

The present research observed research ethics. The informed consent form was embedded in the survey. The data collected from the respondents did not include the names of the respondents. The privacy, security, and confidentiality of the data were ensured by the research team. During data organization and analysis, only the members of the research team that were involved in data coding and analysis had access to the data. In the presentation of results in this report, no individual data is provided, and only aggregate data are reported and discussed.

The present research has limitations. First, the measure of digital citizenship competency used was a self-report questionnaire. The limitations of self-report measures are expected (e.g., some students may have not been honest when responding to the survey). Second, the sample size used is not fully representative of the entire population of 15-year-old students in Lao, especially as participating schools were selected using purposive sampling. Hence, the generalizability of the findings may be limited. Third, while all the competency domains have acceptable or good internal consistency, many of the sub-competencies have less than satisfactory internal consistency, and a few of the sub-competencies have very low internal consistency.

The results indicate that it may be more useful to use the general domains instead of the more specific sub-competencies in describing the digital citizenship competency of the respondents. Fourth, not all possible personal and contextual variables measured in the survey were tested as predictors of the digital competency domains. It is likely that factors not considered in the research could have exerted effects on the respondents' digital citizenship competency. In addition, while the role of various factors on digital citizenship competency was examined using correlational techniques (i.e., multiple regression), the analysis does not provide support for the causal effects of the identified factors on digital citizenship competencies.

The present research also experienced some challenges. (Narrative to be provided by Lao Research Team).

Chapter 3: Findings of the Research

3.1. Summary of Findings on Domains

3.1.1. The students' digital citizenship competency

The current survey aims to generally answer the question "Is DKAP measuring the "digital citizenship competency" of Asia Pacific students?" Table 3 reports the results for the Domains of the Digital Citizenship in the Republic of Lao.

Table 3
Descriptive Results on Domains

Domain	Mean	SD
Digital Literacy	3.21	.42
Digital Safety and Resilience	3.28	.38
Digital Participation and Agency	3.12	.40
Digital Emotional Intelligence	3.06	.41
Digital Creativity and Innovation	2.79	.51

The results for the survey conducted in Lao reveal that it is the Domain on Safety and Resilience that had the highest mean score while it is the lowest for Creativity and Innovation. Such observation is similar to the results of the original survey conducted by UNESCO in 2019 across 4 countries, Korea, Fiji, Vietnam, and Bangladesh. Further analysis revealed that the results for Lao is in the range of the means gathered from the original 4 countries of the study in the domain Digital Literacy and Emotional Intelligence but exceeds the range in Digital Participation and Agency.

While the We Are Social and Hootsuite (2020) reported that 56% of the population of Lao are on social media like Facebook, the high mean rating for Digital Safety and Resilience seem to reveal that Lao children are also aware of their safety in an online environment. Nevertheless, when compared with the four countries of the first survey (UNESCO, 2019), Lao's mean score is lower than Bangladesh who was reported lowest in the domain of Digital Safety and Resiliency. This might interest policymakers in the country to further study and develop projects that can help promote safety and resilience among Lao children in the online world.

On the other hand, the results for Lao also seem to confirm that indeed, children these days need to improve their creativity and innovation skills when managing tasks online. The result of the survey appears to show that Lao children, the same with other countries, also need assistance in this domain. With the improving internet utilization in Lao, children should be taught how to creatively express themselves.

3.1.2. Does gender matter?

The results of the test of difference (Annex 4) indicate that girls have significantly higher mean scores in the Digital Safety and Resilience domain, boys have significantly higher mean scores in both Digital Emotional Intelligence and Digital Creativity and Innovation, and there is no difference between girls and boys in terms of the Digital Literacy and Digital Participation and Agency domains. The results are consistent with the results of the multiple regression analysis which suggest that when other factors are accounted for, gender is associated with Digital Safety and Resilience, Digital Emotional Intelligence, and Digital Creativity and Innovation domains in the same directions as in the results of the test of difference (see Annex 5).

In general, the results point to the significant role that gender plays in the digital citizenship competency of Lao students. The results seem to suggest that while girls are still focused on their safety and survival the boys are already moving towards the advancement of their digital citizenship skills. Digital creativity and innovation are important skills for a country to develop products and services for global competitiveness. While the girls are still working on their personal well-being, the boys have gone beyond the said domain now ready to hone their skills in exploring new possibilities in digital technology. Educational interventions should be designed to bridge the gap in the digital divide due to gender. Future research should further inquire on why gender matters when it comes to certain digital citizenship competencies.

3.1.3. Other personal and contextual factors associated with digital citizenship competency

The multiple regression analysis also indicates the following results: (1) students who reported to have learned coding skills are more likely to have higher scores in the Digital Participation and Agency domain compared to those who reported not to have learned coding skills; (2) students who learned how to develop web or application are more likely to have higher scores in the Digital Safety and Resilience and Digital Creativity and Innovation domains compared to those who reported not to have learned how to develop web or applications; (3) the educational level of students' parents is not associated with students' scores in any domain; and (4) the number of books at the students' homes is associated with higher Digital Literacy scores.

The most important result suggests the relevance of providing adequate learning experiences in using digital technologies (e.g., developing web or application) to students. This result highlights the need to develop specific digital or technological competencies among Lao learners as these competencies further contribute to their digital citizenship.

See Annex 5 for the full results of the multiple regression analyses.

3.2.   Summary of Findings on Competencies

3.2.1   Digital Literacy Competencies

The domain on digital literacy describes childrens' "ability to seek, critically evaluate, and use digital tools and information effectively to make informed decisions" (DKAP, 2019). As reported in Table 3, Lao's mean score for this domain is about 3.21. When compared with the original four countries who participated in the DKAP study in 2019, the mean score gathered for Lao is actually second to that of Korea's and higher than Fiji, Vietnam, and Bangladesh.

The digital literacy domain is also composed of two competencies which are ICT and information literacy. Table 4.1 reports the results for Lao in the said competencies.

Table 4.1
Descriptive Results on Digital Literacy Competencies

Domain	Mean	SD
ICT Literacy	**3.28**	**.46**
Information Literacy	**3.08**	**.53**

The competency on ICT Literacy describes the ability of the children "to manage and operate ICT hardware and software responsibly in digital environments, in order to access and search for data, information and content, and to use them successfully" (DKAP, 2019). The mean score for ICT literacy was highest in Korea and Fiji, but the result reflected in Table 4.1 shows that Lao has a higher mean score between those countries.

On the other hand, the DKAP (2019) describes Information Literacy as the ability of students "to seek, critically evaluate and use digital information effectively to make informed decisions." When compared with the other countries, Lao's mean score for Information Literacy is second to Korea which was reported to be the highest in this domain.

3.2.2 Digital Safety and Resilience Competencies

Another domain in digital citizenship is the safety and resilience which according to DKAP (2019) is "the ability to understand how to protect himself or herself and others from harm in digital space." The mean score gathered for Lao in this domain as reported in Table 4 is 3.28. Among all other domains, safety and resilience is the highest.

Table 4.2
Descriptive Results on Digital Safety and Resilience Competencies

Domain	Mean	SD
Understanding Child Rights	**3.28**	**.52**
Personal data, Privacy, and Reputation	**3.44**	**.53**
Promoting and Protecting Health and Well-Being	**3.07**	**.56**
Digital Resilience	**3.29**	**.59**

The domain on digital safety and resilience has four competencies which are shown in Table 4.2. Contrary to the result of DKAP (2019), the study conducted in Lao revealed that among the four competencies under digital safety and resilience, it is the competency on personal data, privacy, and reputation which gathered the highest mean score rather than understanding child's rights. It appears that Lao children are more aware of the need to manage personal information for their safety and privacy rather than understanding their rights first.

Moreover, the results indicate that it seems policy makers of Lao should work more on making children realize the use of technology in promoting health and well-being which was reported to have the lowest mean score among the competencies of the digital resilience domain.

Lastly, it can be noted that when compared with other countries, Lao's mean score has the following ranks: understanding child's rights is second to Korea, respecting personal data, privacy and reputation is second to Korea, and showing digital resilience is third highest from Fiji.

3.2.3 Digital Participation and Agency Competencies

The domain on digital participation and agency competency describes student's ability to equitably interact, engage and positively influence society through ICT use (DKAP, 2019). In this domain, three competencies are described--interacting, sharing and

collaborating; civic engagement; and netiquette. Table 4.3 reports the results of the survey for Lao in the said domain and competencies.

Table 4.3
Descriptive Results on Digital Participation and Agency Competencies

Domain	Mean	SD
Interacting, Sharing, and Collaborating	**3.42**	**.47**
Civic Engagement	**2.60**	**.69**
Netiquette	**3.34**	**.50**

From Table 4.3, it can be inferred that Lao students indicated highest competence in interacting, sharing, and collaborating. The DKAP (2019) describes that this competency describes student's ability to whether students interact, share data and information, and collaborate with others using suitable digital technologies to achieve shared goals. Notably, the results for Lao recorded higher than Fiji which has the highest mean score in this competency of this domain.

Meanwhile, the competency on civic engagement reports the lowest mean score for the participation and agency competency domain for Lao. It appears that students from Lao need to improve their ability and willingness to act on opportunities to positively influence local and global communities online and/or offline through appropriate digital technology use. In this competency, Lao ties with Vietnam to have the highest mean score.

Lastly, the survey on Lao also revealed that their children observe netiquette or the ability to show ethical and courteous behaviour that informs their choices when interacting and engaging in different digital environments with different individuals and audiences. In this competency, the results gathered for Lao shows that they are third highest from Korea.

3.2.4 Digital Emotional Intelligence Competencies

The domain on emotional intelligence "focuses on the ability to recognize, navigate and express emotions in one's digital intrapersonal and interpersonal interactions" DKAP (2019). In this domain, the framework aims to describe students' self-awareness, self-regulation, self-motivation, interpersonal skills, and empathy.

Table 4.4
Descriptive Results on Digital Emotional Intelligence Competencies

Domain	Mean	SD
Self-awareness	**3.09**	**.52**
Self-regulation	**3.12**	**.59**
Self-motivation	**3.19**	**.56**
Interpersonal skills	**3.04**	**.57**
Empathy	**2.82**	**.67**

Based on Table 4.4, it can be inferred that students indicated high responses on competencies related to themselves such as self-awareness, self-regulation, and self-motivation. Notably, it is the competency of self-motivation to have the highest mean score. In other words, students from Lao seem to be most competent in demonstrating initiative, and a commitment to attain internal or external goals, despite setbacks, in the digital sphere. It also appears that Lao students are able to manage their emotions, moods and impulses during online engagements (self-regulation) and explain their moods, emotions, drives, and how these affect them and others in the digital world, through introspection (self-awareness).

On the other hand, the results for Lao survey appears that students need to develop mostly their competency in relating with others such as the ability to build positive online relationships (interpersonal skills) to communicate, build rapport and trust, embrace diversity, manage conflicts, and make sound decisions. In fact it is empathy that is recorded to have the least mean score for the domain on emotional intelligence. This observation appears to agree with the results of DKAP in 2019. Empathy, according to DKAP (2019), relates to the ability of students to demonstrate awareness and compassion for the feelings, needs and concerns of others during digital interactions.

When compared with other countries in the DKAP (2019) study, the results for Lao showed that for the mean score gathered for the country in self-awareness and empathy is second lowest from Vietnam. The Lao mean scores for self-motivation and interpersonal skills are 3rd highest from Vietnam and Korea respectively. Finally, Lao and Vietnam ranked equal in the last place for self-regulation.

3.2.5   Digital Creativity and Innovation Competencies

The last domain in the digital citizenship framework is creativity and innovation which describes students' ability to express and explore herself or himself through creation of content using ICT tools (DKAP, 2019). In this domain, two competencies are described which are creative literacy and expression.

Table 4.5
Descriptive Results on Digital Creativity and Innovation Competencies

Domain	Mean	SD
Creative Literacy	2.66	.61
Expression	2.89	.59

The results of the survey conducted in Lao reveal that just like with other countries in the DKAP 2019 report, it is the domain of digital creativity and innovation that scored the least. However, the results in Table 4.5 seemed to show that the children in Lao are able to primarily use technology to creatively represent their identities and to exercise their right to fun and relaxation. In other words, children from Lao signified that they are more competent in their self-expression rather than their creative literacy. In this competency, Lao ranked highest when compared with the countries in the DKAP 2019 report.

On the contrary, it appears that the results from Lao show that students need support on the competency of Creative Literacy or the ability to relate and apply skills and use tools to create, adopt, or curate digital content. In this competency, Lao only ranked 3rd from Korea.

3.3. Access and Use of ICT, Usage of Digital Devices, and Internet Use

3.3.1. Which devices do they mostly have access to?

As shown in Table 5, smartphones are the most accessible digital device both at home and local community. These results are consistent with the trend observed in other countries where smartphones were reported to be the most accessible device (UNESCO, 2019). The second most accessible device at home is the laptop, while the second most accessible device at the local community is the desktop computer. At school, the results suggest that desktop computers are the most accessible, followed by smartphones.

These results suggest the preference for using desktop computers over laptops at home, school, or local community.

Table 5
Percentage of students with access to digital devices by type of device

	Desktop Computer	Laptop	Smartphone	Tablet PC	Printer	None of the Above
At home	27.2	18.6	89.0	18.3	13.4	6.0
At school	84.8	13.7	56.4	11.1	71.7	3.0
At the local community	61	22.5	64.4	26.1	56.3	14.7

As seen in Table 5, there are students who reported not having any of the digital devices listed. This suggests the existence of digital divides among the Lao students who participated in the survey. The percentage of students who reported not having access to any digital device at home (6.00) is higher compared with students from Korea and Vietnam but lower compared with students from Bangladesh and Fiji (UNESCO, 2019). While school and local community are able to bridge the gaps in students' access to desktop computers and printers at home, the significant percentage of students who reported not having access to any digital device at the local community still suggests that schools and local community should do more to provide students access to digital devices in order to counter limitations in access to digital devices at home. Moreover, it is still important for the government to develop mechanisms to bridge the gaps in access to desktop computers and laptops at home.

3.3.2. For how long have students used digital devices?

Figure 2 reveals that 4.4% of students reported that they had never used any devices while 11.3% had used a device for less than a year. These results suggest that almost 16% of the participants have never used a digital device until the age of 14. This also means that a great majority of the students reported using digital devices for at least one year.

Further analysis revealed that duration of use of digital devices is a positive predictor of Digital Safety and Resilience and Digital Creativity and Innovation domains (see Annex 5). Thus, it is important that students start having access to digital devices as early as possible to allow them to develop their digital citizenship competencies in more optimal ways.

Figure 2
Years of experience using digital devices
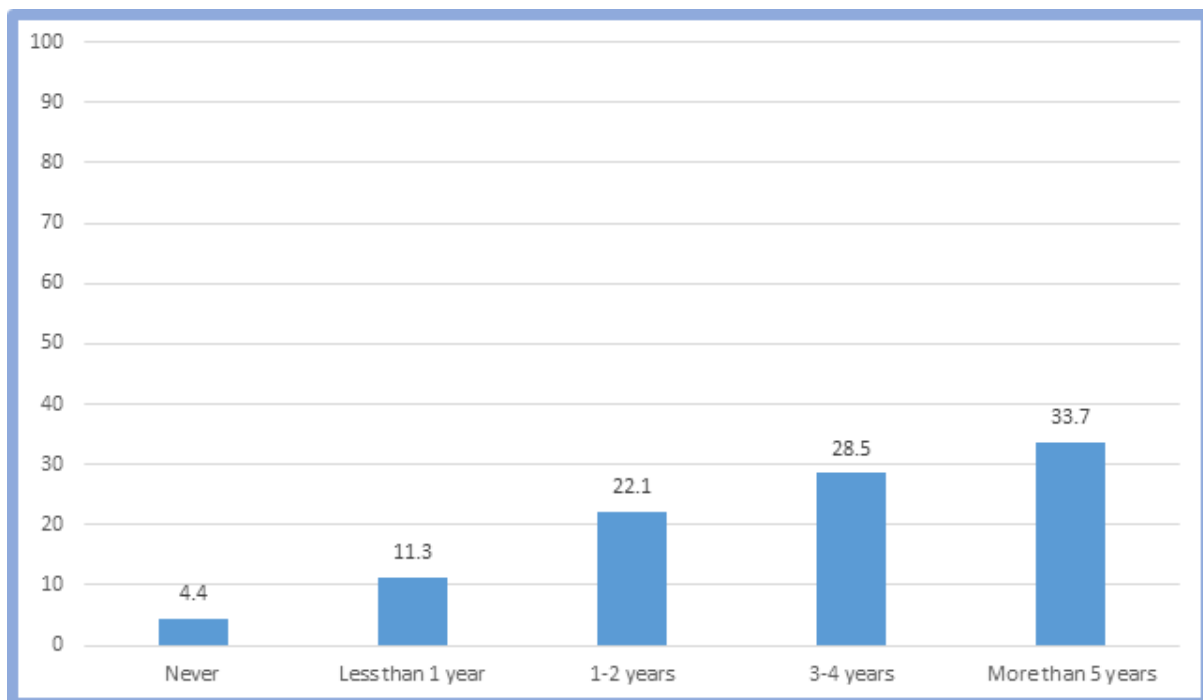
3.3.3. For how many hours a day do students use the Internet with their digital devices?

A small percentage (5%) of students reported hardly ever using the Internet, while more than one-third (33.3) reported using the Internet with their devices from less than an hour to 1-2 hours per day. More students reported using the Internet for at least three hours (Figure 3).

Further analysis revealed that the frequency of using the Internet with their digital devices is not a predictor of the digital citizenship competency domains, except with Digital Safety and Resilience. In other words, students who spend more time online in a day have a higher level of Digital Safety and Resilience (see Annex 5).

Figure 3
Length of time spent on the Internet using digital devices
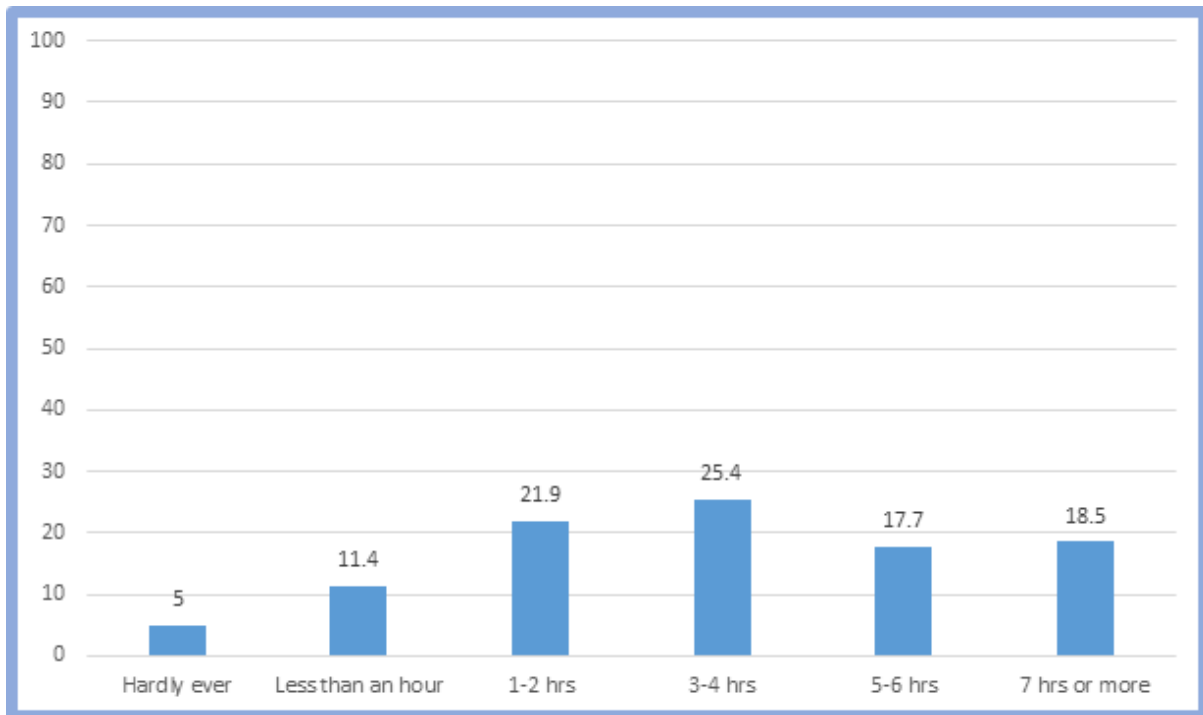
Additional results indicate that there are more students who reported that they use the Internet or computers for 1-2 hours for school study (36.2), for personal purpose (35.4), for leisure (26.1), and for socializing with friends (32.3). A significant percentage (19.2) of the students reported that they hardly ever used the Internet or computers for school study which is another indication of digital divide among the students (See Annex 6).

3.3.4. How many students have access to the Internet?

Not surprisingly, wireless Internet is the most widely used type of connectivity as reported by the students, and this is the case at home, school, or local community (Table 6). This result is consistent with the growing trend of using wireless connectivity in schools. However, a significant percentage of the students reported not having access to any type of connectivity in all places. This result is alarming and indicates the digital divide that exists among Lao students in terms of connectivity.

Table 6

Percentage of students with access to Internet by type of connectivity

	Wired Internet	Wireless Internet	None
At home	35.6	58.0	21.2
At school	28.9	42.7	38.0
At the local community	35.0	49.1	30.1

3.3.5. From whom do students learn about computers and the Internet?

Figure 4 shows that in terms of the role of others on students' use of computers, more than 31% of students reported that they learned by themselves, while almost 50% reported that they learned from their teachers. The trend is different in terms of the role of others in students' use of the Internet as more than half (67.7%) of the students reported that they learned by themselves, and more students reported learning from family more than learning from their teachers (Figure 5).

Figure 4
Percentage of students who were taught how to use computers by source of learning
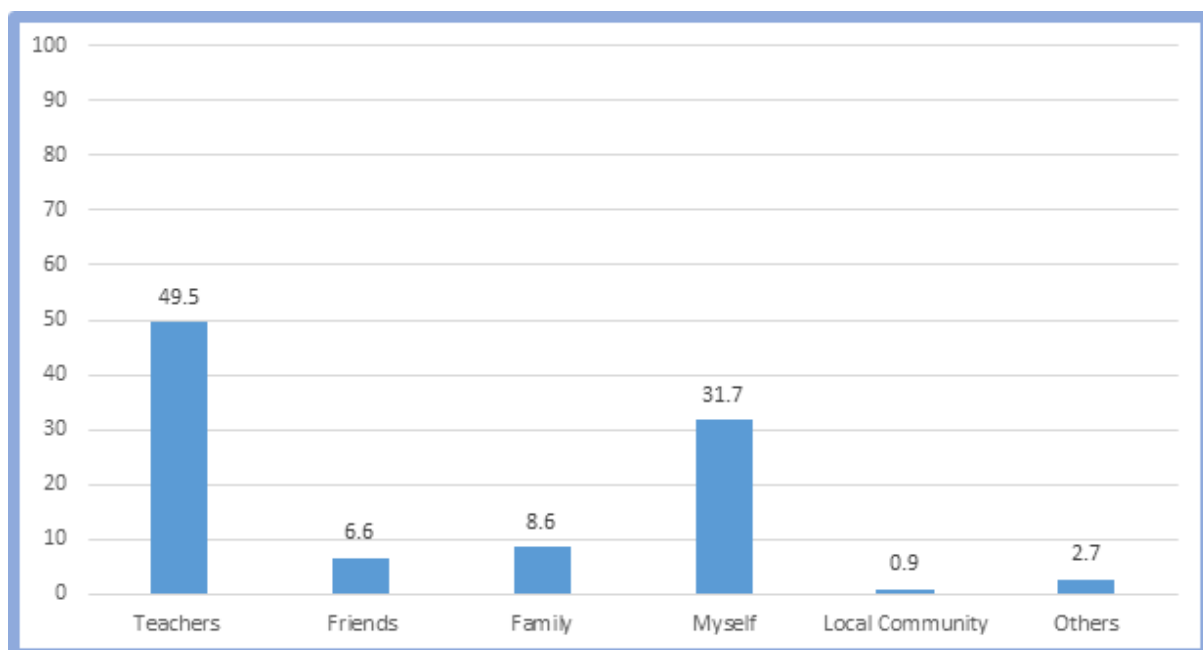
Figure 5
Percentage of students who were taught how to use Internet by source of learning
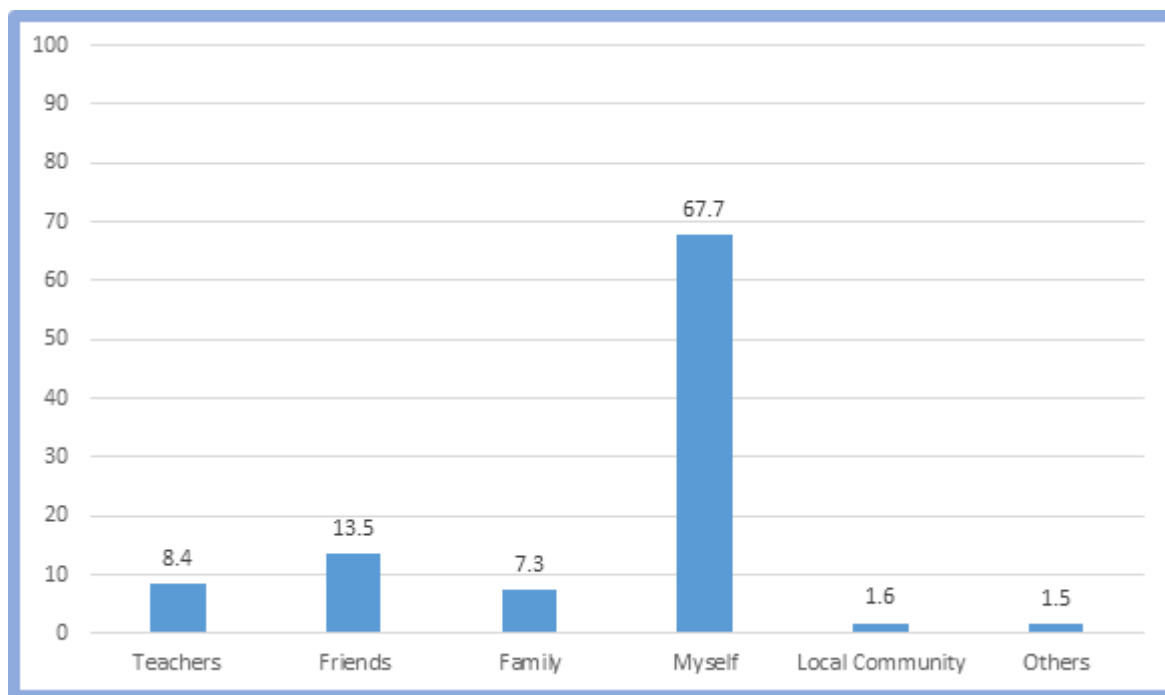
3.3.6. Do other people guide students to use the Internet safely?

Table 7 shows that there are more students who reported that their parents/caregivers guide them in using the Internet safely all the time compared with other stakeholders. However, the results show that there are more students who reported being guided by their teachers often, very often, or all the time (43.9) in using the Internet safely.

Table 7
Percentage at which students are guided to use the Internet safely by type of stakeholder

	Never	Hardly ever	Sometimes	Often	Very often	All the time
Parents/caregivers	24.3	7.9	33.2	13.4	6.5	14.7
Teachers	15.2	8.7	45.6	17.9	6.0	6.5
Siblings	12.7	7.7	35.7	25.9	8.1	9.9
Peers	10.5	10.2	38.8	20.6	9.0	10.9

3.3.7. Do other people encourage students to explore or learn things using the Internet?

As shown in Table 8, there are more students who reported that their parents/caregivers encourage them to learn new things on the Internet all the time compared with other stakeholders. Surprisingly, the results show that there are more students who reported getting encouragement from their peers in learning new things using the Internet often, very often, or all the time (46.7).

Table 8

Percentage at which students are encouraged to explore or learn new things on the Internet by type of stakeholder

	Never	Hardly ever	Sometimes	Often	Very often	All the time
Parents/caregivers	17	10.5	36.6	15.5	7.3	13.1
Teachers	9.1	8.1	43.7	21.4	9.5	8.1
Siblings	10.4	9.1	35.9	23.6	12.0	9.0
Peers	6.7	9.4	37.2	23.6	11.0	12.1

Chapter 4: Conclusions and Recommendations

4.1. Conclusions

The main purpose of this study is to determine the digital citizenship competency of the Lao students using the Digital-Kids in Asia Pacific (DKAP) validated survey questionnaire with the five (5) competency domains as its framework, namely: Digital Literacy, Digital Safety and Resilience, Digital Participation and Agency, Digital Emotional Intelligence, and Digital Creativity and Innovation. Given the key findings in this study, the following inferences can be drawn.

First, it is important to be cognizant of the importance of digital citizenship education at the basic education level. Such has become more critical in the midst of the current health emergency due to the COVID-19 Pandemic which prompted Lao's Ministry of Education and Sports (MoES) to implement several modalities of education delivery to include the use of a blend of print, TV, radio and online platforms. The overall results of the current study clearly show the need for putting together a comprehensive program related to digital citizenship education.

Secondly, the five (5) components or competency domains that were used in this study: Digital Literacy, Digital Safety and Resilience, Digital Participation and Agency, Digital Emotional Intelligence, and Digital Creativity and Innovation approximates the status and the level of competency on digital citizenship education among the Lao students. But since Lao PDR is on the early stage in its way to using ICT in many facets of the economy and society, the DKAP survey questionnaire may be modified to contextualize the experiences of the students so as to capture the nuances of the use of ICT and the general status of digital citizenship among the young people of Lao.

Thirdly, there is fundamentally unequal access to ICT-related devices and Internet connectivity among the Lao students which hampered the opportunity for learning. Thus, the need to address concerns relative to access not just to digital devices but to internet connectivity plays an important role in developing all five competency domains in digital citizenship among the majority, if not all students. Hence, the need for addressing the phenomenon of 'digital divide' among students in the country.

Lastly, while the research point to the important role play by teachers in the digital citizenship education of Lao learner, there seems to be a shift of learning ICT and information literacy from the teachers to self-learning and learning from siblings and peers especially in the higher level skills like the use of internet. This suggests that learning digital citizenship competencies are shaped by multiple stakeholders. This further connotes that

there could be a differentiated concepts and skills of citizenship learned from teachers who were trained to teach said concepts and skills from those who were informally trained like the peers or siblings.

4.2. Recommendations

This research project provides empirical evidence on the competency level of Lao students with respect to digital citizenship education. The results of the study serve as valuable inputs and guides for policymakers, decision makers, curriculum experts and other key education stakeholders especially at the national level to develop and subsequently implement comprehensive and holistic digital citizenship education policies and programs. The following are policy recommendations that are of great consideration:

1. Develop a comprehensive training package for optimal level of digital competence to all teachers and professionals who will be involved in the training and implementation of digital literacy intervention programs for Lao students. Effective and quality ICT and digital literacy training programs must reach all the students as much as possible in consideration to their needs, interest, readiness, and skills. Priority shall be given to those students who are members of the less privileged groups. Likewise, there is an imperative to revisit and enhance the teacher training program to ensure that digital citizenship education is explicitly included in the teacher education curriculum.

2. The Ministry of Education and Sports of Lao PDR may consider conducting a benchmarking study with other countries in the ASEAN region to benefit from the best practices and the lessons learned in the effective rollout and implementation of digital literacy programs. Moreover, MoES may facilitate the dialogue among key education stakeholders (business community, civil society organizations, parents, government leaders, among others) to rally support from them in the implementation of digital literacy programs to improve the level of competency of the young people on digital citizenship education.

3. The government of Lao PDR through its MoES in partnership with universities and other academic institutions in the country, may conduct further research to provide evidence that would really reflect the actual realities of the Lao in terms of digital citizenship education. These researches may cover issues on access or inclusion, distinct context of Lao, gender, and other risks and vulnerabilities that are commonly experienced by both teachers and students in relation to the use of ICT. It is expected that future research must aim also at providing more specific, context-based solutions to address the challenges of digital literacy and digital citizenship education among the young people of Lao PDR.

4. Policies, enabling mechanisms, and programs should be established to develop digital citizenship skills in all areas with emphasis on empathy, civic engagement, digital creativity, and innovation. While skills for global competitiveness are important, skills to develop social responsibility and civic engagement should not be missed.

5. Collaboration between and among the government, industry and private individuals may be enhanced to develop the technological infrastructure for honing the digital citizenship of Lao youth. Collaborative projects or programs may pool resources of various stakeholders creating sustainable practices in the area of digital citizenship. Future possibilities must be explored to make the program on digital citizenship successful. The possibility of strengthening engagement of government, industries and non-government agencies to develop policies and programs may be designed. This would mean that all stakeholders will be able to contribute and pool their resources to achieve this goal.

4.3. Concluding Remarks

It can be said that the DKAP framework and survey questionnaire are important developments that provide opportunities for counties or educational systems in the Asia-Pacific region to assess the development of digital citizenship among their students. The data in this study pointed out the different forms of digital inequalities among Lao students and highlight the important role of the government and other educational stakeholders to address the gaps identified. This research has shown not only the data on digital citizenship of Lao students but also opened future strategies for governments to take an active role in strengthening competencies in global citizenship.

The DKAP framework can be enriched by developing goals with specific indicators on digital citizenship similar to Sustainable Development Goals or Beijing Platform for Action. These goals with indicators may be used as metrics and basis for government accomplishment reports. Moreover, the developed goals may also be transformed into standards for quality assurance system of schools or of government units.

It is critical for Lao and other countries to continue to examine and expound on the DKAP concepts as digital citizenship competencies are critical for individuals and societies to be successful in a technology-driven world.

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Annex 1: DKAP Survey Questionnaire

Section A

A. How much do you agree with the following statements?

Fill one circle for each line.

No		Disagree a lot	Disagree a little	Agree a little	Agree a lot
A1	I can edit electronic resources (e.g., text, graphics, audio, videos)	①	②	③	④
A2	I use social media platform (e.g., Facebook, Instagram, Snapchat, LINE, We Chat) to share ideas, participate in discussions, and collaborate with others.	①	②	③	④
A3	I can set up a safe computing environment (e.g., remove computer viruses, install security programs/antivirus).	①	②	③	④
A4	I can transfer photos, music, and video files saved on my computer into other digital devices (e.g., mobile phone, tablet PC).	①	②	③	④
A5	I use computer software (e.g., Microsoft Word, Microsoft PowerPoint, Google Docs) to complete learning tasks at school.	①	②	③	④
A6	I know how to use the latest digital devices.	①	②	③	④
A7	I use digital devices in order to search for information and applications I need.	①	②	③	④
A8	I use digital devices for learning at home.	①	②	③	④
A9	I use digital devices for my personal interest (e.g., games, chatting, shopping, searching for information).	①	②	③	④
A10	I assess the relevance of the digital information to complete learning tasks at school.	①	②	③	④
A11	I can separate reliable from unreliable information when searching for digital information.	①	②	③	④
A12	I search for and find information to complete learning tasks on the Internet.	①	②	③	④
A13	I know I need to report the source of information when using information attained from online.	①	②	③	④
A14	If I find wrong information on the Internet, I can correct it.	①	②	③	④

B. How much do you agree with the following statements?

Fill one circle for each line.

No		Disagree a lot	Disagree a little	Agree a little	Agree a lot
B1	I understand I should show respect to others on the Internet.	①	②	③	④
B2	I understand I should protect the privacy and security of others.	①	②	③	④
B3	Since it is against copyright law to copy software illegally, I would not let myself make a copy.	①	②	③	④
B4	I read the privacy policy of websites I visit when using the Internet.	①	②	③	④
B5	I try to avoid threatening other people's personal information when using digital information.	①	②	③	④
B6	I try to avoid infringing other people' intellectual property rights (e.g., software copyrights, portrait rights) when searching for and using digital information.	①	②	③	④
B7	I try to protect my personal information from others online.	①	②	③	④
B8	I know which information I should and should not share on the Internet.	①	②	③	④
B9	I find myself using digital devices for longer periods of time than intended.	①	②	③	④
B10	I use digital devices to relieve myself from stress (e.g. listening to music, watching movies, SNS).	①	②	③	④
B11	I feel anxious if I have not checked for messages or switched on digital devices for some time.	①	②	③	④
B12	I can modify privacy setting to keep myself safe/away from unwanted contacts (e.g., spam texts, emails).	①	②	③	④
B13	I try to avoid clicking on information that looks weird or suspicious.	①	②	③	④
B14	If a person is bothering me online, I can ask the person to stop sending unwanted disturbing messages or emails.	①	②	③	④

B15-18. Think about how you will react in the following situations:

Choose all that apply.

No.		Get rid of it immediately by closing the page, deleting the file, or scrolling away	Talk about it with parents/ caregivers	Use a program that prevents it from happening again	Talk about it with a friend	Look away or close my eyes	Keep looking	Block the webpage or website	Don't know what to do
B15	How will you react when you are exposed to unwanted disturbing files or websites (e.g., pornography website, violent media)?	①	②	③	④	⑤	⑥	⑦	⑧

No.		Block and report the person	Delete the contact	Ignore the messages and the person	Talk with parents/ caregivers about what to do	Ask the person to stop sending these messages or pictures	Talk with teachers about what to do	Report the issue to the police and show them what happened	Don't know what to do
B16.	How will you react when you receive unwanted disturbing messages including annoying messages or embarrassing pictures from someone on your contact list?	①	②	③	④	⑤	⑥	⑦	⑧

No.		Change your account password	Review privacy settings and choose a more secure password	Use a report button	Disable or delete the account and make a new account	Ask parents/ caregivers to help	Ask teachers to help	Report the issue to the police and show them what happened	Don't know what to do
B17.	How will you react when you find that your personal information is misused, compromised or acquired without permission online?	①	②	③	④	⑤	⑥	⑦	⑧

No.		Block and report the persons	Delete the contact	Show the persons that I am not bothered by their behavior by ignoring them	Ask the persons to stop sending annoying messages or pictures	Talk with teachers about what to do	Report the issue to the police and show them what happened	Keep the evidence of bullying (e.q. screenshot)	Don't know what to do
B18.	How will you react when you are bullied online by friends or others?	①	②	③	④	⑤	⑥	⑦	⑧

C. How much do you agree with the following statements?

Fill one circle for each line

No		Disagree a lot	Disagree a little	Agree a little	Agree a lot
C1	I use the Internet to talk to people from places or backgrounds different from mine.	①	②	③	④
C2	I use the Internet to share something I am good at or I know well.	①	②	③	④
C3	I can share my knowledge online to anyone if it is helpful to him/her.	①	②	③	④
C4	I make new friendships with other people online.	①	②	③	④
C5	I post news on social issues online (e.g., Facebook, Instagram, blog).	①	②	③	④
C6	I use the Internet to create solutions to problems in my school.	①	②	③	④
C7	I use the Internet to create solutions to problems in my town/community.	①	②	③	④
C8	I get involved online in social issues.	①	②	③	④
C9	If I disagree with people online, I watch my language so that it does not come across as mean.	①	②	③	④
C10	I am careful to make sure that the pictures I post or send will not embarrass other people or get them into trouble.	①	②	③	④
C11	My favorite online places are where people are respectful toward each other.	①	②	③	④
C12	I do not add to arguments and insulting interactions that happen on the Internet.	①	②	③	④

D. How much do you agree with the following statements?

Fill one circle for each line

No		Disagree a lot	Disagree a little	Agree a little	Agree a lot
D1	I am aware of my feelings that I experience in my interactions online.	①	②	③	④
D2	I express myself in a way that makes a good impression on others when I write a post or comments on SNS (e.g., Facebook, Instagram).	①	②	③	④
D3	I am aware of the meaning of non-verbal messages (e.g., smiley face, emoji) that I send to other people on the Internet.	①	②	③	④
D4	I express my feelings freely on the Internet using online communications.	①	②	③	④
D5	I can manage my feelings when I talk with other people on the Internet.	①	②	③	④
D6	Even though I get distracted during online classes or activities, I can easily go back to my work again.	①	②	③	④
D7	I stick to my goals when I use the Internet to do assignments at home.	①	②	③	④
D8	I am motivated by the good results that my group can get from the projects that we do online.	①	②	③	④
D9	Even though I face challenges while using digital devices, I solve the problem without giving up.	①	②	③	④
D10	When I use digital devices or software (e.g., programs, applications) for the first time, I expect I am able to do well.	①	②	③	④
D11	I communicate comfortably with people who have different backgrounds, appearances, and opinions on the Internet.	①	②	③	④
D12	I help other people feel better when they are not feeling well on the Internet (e.g., when they read negative comments or see awful pictures of themselves posted by others).	①	②	③	④
D13	I know how to resolve the conflicts that arise when I interact with people from diverse backgrounds on the Internet.	①	②	③	④
D14	When I meet friends online, I easily empathize with their emotions.	①	②	③	④
D15	When I talk with friends on the Internet, I understand their perspectives even if I disagree.	①	②	③	④
D16	When I meet friends on the Internet, I easily recognize what they want to talk about.	①	②	③	④

E. How much do you agree with the following statements?

Fill one circle for each line

No		Disagree a lot	Disagree a little	Agree a little	Agree a lot
E1	I make changes to the digital contents (e.g., photos, videos, music, text, etc.) that others have produced.	①	②	③	④
E2	I remix existing digital contents by using digital media software (e.g., programs, applications).	①	②	③	④
E3	I create presentation slides to support my ideas or opinions.	①	②	③	④
E4	I create something new from existing digital contents.	①	②	③	④
E5	I express my ideas through selecting, organizing, and sharing existing digital materials.	①	②	③	④
E6	I use the Internet to try out different ways of expressing myself.	①	②	③	④
E7	I express my personality online.	①	②	③	④
E8	I show a better version of myself online.	①	②	③	④
E9	I express who I want to be online.	①	②	③	④
E10	There are certain things I express about myself more freely online than offline.	①	②	③	④
E11	When I'm online, I present myself how I want others to view me.	①	②	③	④

Section F

No.		Girl	Boy
F1.	Are you a girl or a boy?	①	②

F2. When were you born?

Month	Jan	Feb	Mar	April	May	June	July	Aug	Sept	Oct	Nov	Dec
Year	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**

F3. What grade are you in?

Grade Level	7	8	9	10	11	12

No.		Test language/English	Other
F4	What language do you speak at home most of the time?	①	②

For Other, please specify _____

No.		Test country (Philippines)	Other
F5	Which country were you born in?	①	②

For Other, please specify _____

No.		Lower secondary/ Junior High School	Upper secondary / Senior High School	Post - secondary / College	Masters/ Doctoral	I don't know
F6.	What is the highest grade or level of school you expect to complete?	①	②	③	④	⑤

[Note: The month should not include school vacation or holidays]

No.		None	1 or 2 days	3 or 4 days	5 to 10 days	More than 10 days
F7.	How many days were you absent from school in the last month?	①	②	③	④	⑤

F8. Outside of school, how much time each day do you usually spend doing the following activities?

	Less than an hour	1-2 hour a day	3-4 hours a day	5-6 hours a day	7 hours a day or more
F8-1) Having fun with friends	①	②	③	④	⑤
F8-2) Helping my family with work, housework or looking after somebody	①	②	③	④	⑤
F8-3) Doing homework or other study activities (e.g., private education)	①	②	③	④	⑤
F8-4) Participating in volunteer work	①	②	③	④	⑤
F8-5) Doing fine arts activities (e.g., drawing or playing an instrument)	①	②	③	④	⑤

No.		Never	Less than 1 year	1-2 years	3-4 years	More than 5 years
G1.	How long have you been using digital devices (e.g., desktop/laptop, smartphone, tablet PC)?	①	②	③	④	⑤

No.		Hardly ever	Less than an hour	1-2 hour	3-4 hours	5-6 hours	7 hours or more
G2.	How often do you go online or use the Internet using digital devices (e.g., smartphone, desktop/laptop, tablet PC) per day?	①	②	③	④	⑤	⑥

G3. Where do you usually access Internet?

	Hardly ever	At least every month	At least every week	At least every day				
				Less than an hour	1-2 hour a day	3-4 hours a day	5-6 hours a day	7 hours a day or more
G3-1) Home	①	②	③	④	⑤	⑥	⑦	⑧
G3-2) School	①	②	③	④	⑤	⑥	⑦	⑧
G3-3) Internet Cafe	①	②	③	④	⑤	⑥	⑦	⑧
G3-4) local community or local district (e.g., local library, community center)	①	②	③	④	⑤	⑥	⑦	⑧

Please check all that apply.

No.		Desktop computer	Laptop	Smart Phone	Tablet PC (eg., iPad, Galaxy Tab	Printer	None of the above
G4.	Do you have access to any of these things at your home?	①	②	③	④	⑤	⑥
G5.	Do you have access to any of these things in your school?	①	②	③	④	⑤	⑥
G6.	Do you have access to any of these things in your local community (e.g., local library, community center)?	①	②	③	④	⑤	⑥

No.		Wired Internet	Wireless Internet	None
G7.	Which of the following can you access at home?	①	②	③
G8	Which of the following can you access at school?	①	②	③

[Note. Wireless Internet means Internet connectivity via radio waves rather than wires. Simply imagine Wi-Fi. Wired Internet means Internet connectivity using a network hub via a wired connection like satellite, cable, DSL, etc.]

No.		Yes	No
G9.	Does your local community (e.g., local library, community center) or local district provide any place to use the Internet?	①	②

Please check all that apply.

No.		Wired Internet	Wireless Internet	None
G10	Which of the following can you access in your local community or local district?	①	②	③

No.		My teachers	My friends	My Family	I learned myself	My local community (eg., library, community center)	Others
G11.	Who taught you most about how to use computers?	①	②	③	④	⑤	⑥
G12.	Who taught you most about how to use the Internet?	①	②	③	④	⑤	⑥

No.		Hardly ever	Less than an Hour	1-2 hour	3-4 hours	5-6 hours	7 hours or more
G13.	How often do you use computers or the Internet for school study (e.g., doing homework, preparing and reviewing classes) per day?	①	②	③	④	⑤	⑥
G14.	How often do you use computers or the Internet for studying for personal purpose (e.g., studying English, preparing certificates, or searching information for your career) per day?	①	②	③	④	⑤	⑥
G15	How often do you use computers or the Internet for leisure (e.g., computer games, music, comics, videos) per day?	①	②	③	④	⑤	⑥
G16	How often do you use computers or the Internet for socializing with your friends	①	②	③	④	⑤	⑥

		yes	No
	(e.g., Social Network Services, messenger program, blog) per day?				

No.		yes	No
G17	Have you ever learned basic coding skills at school?	①	②
G18	Have you ever developed websites or applications	①	②

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Section H

</div>

Please check all that apply

No.		Mother (including step or foster mother)	Father (including step or foster father)	Grand-parent (s) or other relatives	Siblings (including half, step or foster siblings)	I live in a foster home or children's home	I live alone	Someone or somewhere else
H1.	Who usually lives at home with you?	①	②	③	④	⑤	⑥	⑦

For Someone or somewhere else (please state): _____

No.		Did not go to school	Primary	Lower secondary	Upper secondary	Post-secondary	Masters/ Doctoral	I don't know
H2.	What is the highest level of schooling completed by your mother?	①	②	③	④	⑤	⑥	⑦
H3	What is the highest level of schooling completed by your father?	①	②	③	④	⑤	⑥	⑦

H4. Do you have the following item(s) at your home?

	Yes	No
H4-1) Car	①	②
H4-2) Television	①	②
H4-3) Bathrooms with a bathtub or shower	①	②

No.		0-10 books	11-25 books	26-100 books	101-200 books	201- 500 books	More than 500 books
H5.	How many books are there in your home?	①	②	③	④	⑤	⑥

[Note. There are usually about 15 books per foot of shelving. Do not include magazines, newspapers, or your schoolbooks.]

H6. When you use the Internet, how often do the following person/people suggest ways to use the Internet safely?

	Never	Hardly ever	Sometimes	Often	Very often	All the time
H6-1) parents/caregivers	①	②	③	④	⑤	⑥
H6-2) teachers	①	②	③	④	⑤	⑥
H6-3) siblings	①	②	③	④	⑤	⑥
H6-4) peers	①	②	③	④	⑤	⑥

H7. When you use the Internet, how often do the following person/people encourage you to explore or learn things on the Internet?

	Never	Hardly ever	Sometimes	Often	Very often	All the time
H7-1) parents/caregivers	①	②	③	④	⑤	⑥
H7-2) teachers	①	②	③	④	⑤	⑥
H7-3) siblings	①	②	③	④	⑤	⑥
H7-4) peers	①	②	③	④	⑤	⑥

Annex 2: Reliability Analysis Results

Internal Consistency Reliability of the Survey Questionnaire

Competency	Cronbach's alpha
Digital Literacy	.78
ICT Literacy	.73
Information Literacy	.60
Digital Safety and Resilience	.71
Understanding Child Rights	.40
Personal data, Privacy, and Reputation	.57
Promoting and Protecting Health and Well-Being	.39
Digital Resilience	.44
Digital Participation and Agency	.68
Interacting, Sharing, and Collaborating	.54
Civic Engagement	.71
Netiquette	.43
Digital Emotional Intelligence	.80
Self-awareness	.54
Self-regulation	.48
Self-motivation	.51
Interpersonal skills	.48
Empathy	.64
Digital Creativity and Innovation	.79
Creative Literacy	.71
Expression	.75

Annex 3: Confirmatory Factor Analysis Results

Model Fit Summary of Domains

	TLI	CFI	RMSEA (90% CI)
Digital Literacy	.819	.869	.061 (.056-.067)
Digital Safety and Resilience	.724	.813	.063 (.057-.069
Digital Participation and Agency	.847	.900	.056 (.049-.063)
Digital Emotional Intelligence	.845	.893	.053 (.048-.058)
Digital Creativity and Innovation	.877	.920	.066 (.059-.073)

Standardized Factor Loadings on Digital Literacy

Sub-competency	Item	Standardized Parameter Estimate	p
ICT Literacy	A1	.453	<.001
	A2	.372	<.001
	A3	.525	<.001
	A4	.542	<.001
	A5	.537	<.001
	A6	.586	<.001
	A7	.562	<.001
	A8	.542	<.001
	A9	.200	<.001
Information Literacy	A10	.604	<.001
	A11	.377	<.001

Sub-competency	Item	Standardized Parameter Estimate	p
	A12	.500	<.001
	A13	.503	<.001
	A14	.440	<.001

Standardized Factor Loadings on Digital Safety and Resilience

Sub-competency	Item	Standardized Parameter Estimate	p
Understanding Child Rights	B1	.376	<.001
	B2	.285	<.001
	B3	.495	<.001
	B4	.325	<.001
Personal data, Privacy, and Reputation	B5	.609	<.001
	B6	.605	<.001
	B7	.404	<.001
	B8	.420	<.001
Promoting and Protecting Health and Well-Being	B9	.453	<.001
	B10	.475	<.001
	B11	.347	<.001
Digital Resilience	B12	.494	<.001
	B13	.452	<.001
	B14	.423	<.001

Standardized Factor Loadings on Digital Participation and Agency Competencies

Sub-competency	Item	Standardized Parameter Estimate	p
Interacting, Sharing, and Collaborating	C1	.387	<.001
	C2	.570	<.001
	C3	.516	<.001
	C4	.480	<.001
Civic Engagement	C5	.537	<.001
	C6	.732	<.001
	C7	.771	<.001
	C8	.449	<.001
Netiquette	C9	.339	<.001
	C10	.527	<.001
	C11	.484	<.001
	C12	.329	<.001

Standardized Factor Loadings on Digital Emotional Intelligence Competencies

Sub-competency	Item	Standardized Parameter Estimate	p
Self-Awareness	D1	.503	<.001
	D2	.525	<.001
	D3	.466	<.001
	D4	.468	<.001
Self-regulation	D5	.526	<.001
	D6	.498	<.001
	D7	.433	<.001
Self-motivation	D8	.457	<.001

Sub-competency	Item	Standardized Parameter Estimate	p
	D9	.547	<.001
	D10	.535	<.001
Interpersonal skills	D11	.581	<.001
	D12	.367	<.001
	D13	.521	<.001
Empathy	D14	.655	<.001
	D15	.559	<.001
	D16	.626	<.001

Standardized Factor Loadings on Digital Creativity and Innovation Competencies

Sub-competency	Item	Standardized Parameter Estimate	p
Creative Literacy	E1	.413	<.001
	E2	.659	<.001
	E3	.543	<.001
	E4	.701	<.001
	E5	.590	<.001
Expression	E6	.599	<.001
	E7	.665	<.001
	E8	.594	<.001
	E9	.621	<.001
	E10	.401	<.001
	E11	.581	<.001

Annex 4: TABLE ON DIFFERENCES IN DOMAIN BY GENDER

DOMAIN		Mean	SD	t	Sig.
Digital Literacy	Girl	3.22	.41	.77	.44
	Boy	3.20	.44		
Digital Safety and Resilience	Girl	3.32	.37	3.22	.00
	Boy	3.25	.40		
Digital Participation and Agency	Girl	3.13	.38	1.01	.31
	Boy	3.10	.41		
Digital Emotional Intelligence	Girl	3.03	.40	2.37	.02
	Boy	3.08	.42		
Digital Creativity and Innovation	Girl	2.72	.50	4.79	.00
	Boy	2.86	.51		

ANNEX 5: MULTIPLE REGRESSION ANALYSIS RESULTS

Multiple Regression Analysis Results for Digital Literacy

Predictors	Standardized Beta	t	Sig.
Gender	-.014	-.483	.629
Duration of use	-.002	-.065	.948
Frequency of use	.028	.812	.417
Learned coding skills	-.051	-1.764	.078
Developed web or application	.004	.124	.902
Parents education level	.044	1.462	.144
Number of books	.066	2.277	.023
Model Summary: R Square = .013, F = 2.428, Sig. = .018			

Multiple Regression Analysis Results for Digital Safety and Resilience

Predictors	Standardized Beta	t	Sig.
Gender	-.073	-2.650	.008
Duration of use	.119	3.644	.000
Frequency of use	.117	3.509	.000
Learned coding skills	-.020	-.717	.473
Developed web or application	.106	3.794	.000
Parents education level	.033	1.137	.256
Number of books	.021	.745	.456
Model Summary: R Square = .074, F = 14.382, Sig. = .000			

Multiple Regression Analysis Results for Digital Participation and Agency

Predictors	Standardized Beta	t	Sig.
Gender	-.021	-.726	.468
Duration of use	-.004	-.122	.903
Frequency of use	-.029	-.852	.394
Learned coding skills	-.090	-3.106	.002
Developed web or application	.005	.168	.867
Parents education level	-.058	-1.930	.054
Number of books	.055	1.894	.058
Model Summary: R Square = .016, F = 2.903, Sig. = .005			

**Multiple Regression Analysis Results for Digital Emotional Intelligence**

Predictors	Standardized Beta	t	Sig.
Gender	.069	2.422	.016
Duration of use	-.008	-.242	.809
Frequency of use	.018	.533	.594
Learned coding skills	-.028	-.973	.331
Developed web or application	-.033	-1.134	.257
Parents education level	-.037	-1.213	.225
Number of books	.054	1.858	.063
Model Summary: R Square = .010, F = 1.884, Sig. = .069			

**Multiple Regression Analysis Results for Digital Creativity and Innovation**

Predictors	Standardized Beta	t	Sig.
Gender	.134	4.813	.000
Duration of use	-.171	-5.171	.000
Frequency of use	.051	1.513	.131
Learned coding skills	-.047	-1.666	.096
Developed web or application	-.087	-3.058	.002
Parents education level	.002	.081	.936
Number of books	.027	.955	.340
Model Summary: R Square =.052, F =9.774, Sig. = .000			

ANNEX 6: FIGURES ON TIME SPENT USING COMPUTERS OR THE INTERNET FOR VARIOUS PURPOSES

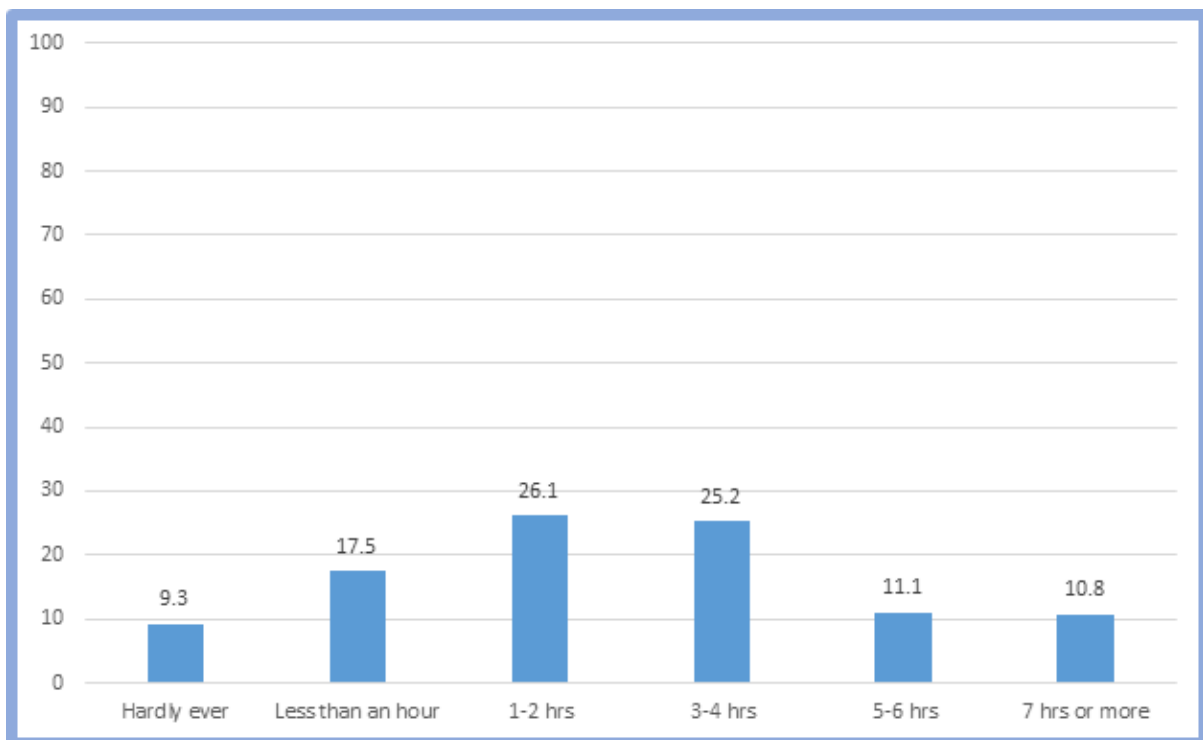**Length of Time Spent Using Computers or the Internet for School Study**
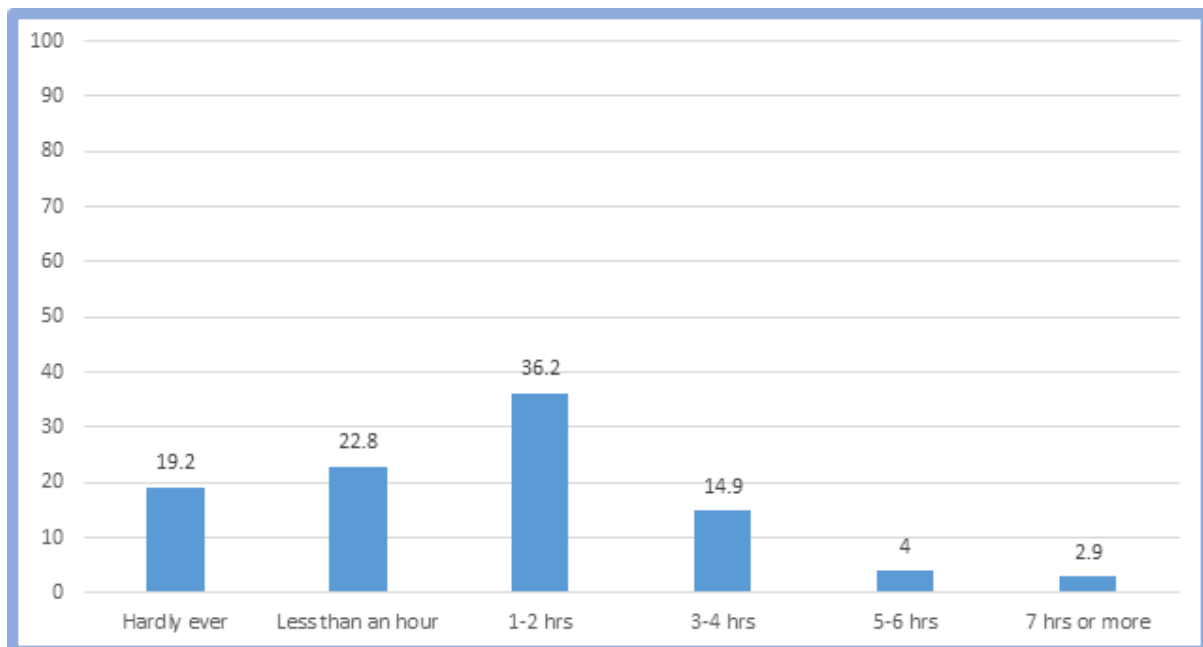
Length of Time Spent Using Computers or the Internet for Personal Purpose
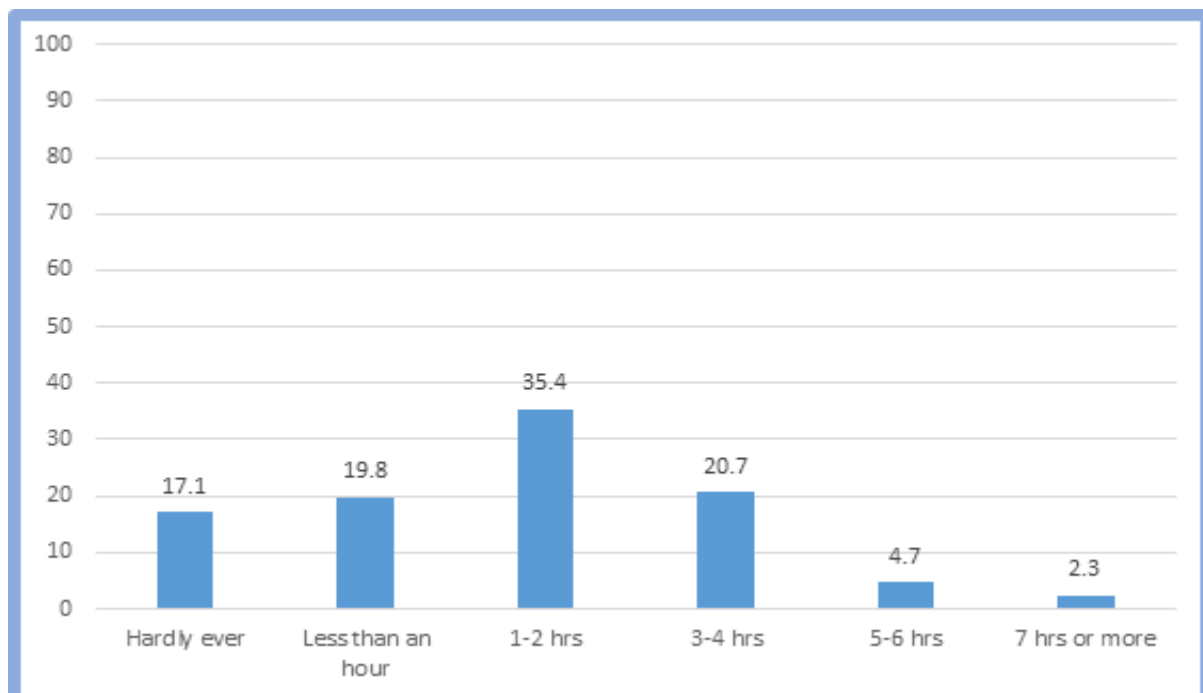
Length of Time Spent Using Computers or the Internet for Leisure

Length of Time Spent Using Computers or the Internet for Socialization with Friends