DIGITAL KIDS **ASIA-PACIFIC**

United Nations
Educational, Scientific and
Cultural Organization

Korean Republic
Funds-in-Trust

**Southeast Asian
Ministers of Education
Organization**

INSIGHTS INTO THE DIGITAL LIVES OF CHILDREN

in Indonesia, Lao People's Democratic Republic, and the Philippines

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Digital Kids Asia-Pacific

Insights into the Digital Lives of Children in Indonesia, Lao People's Democratic Republic, and the Philippines

Prepared and published by the SEAMEO Secretariat
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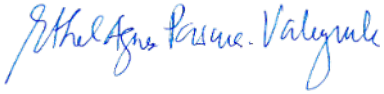
A MESSAGE FROM THE SEAMEO SECRETARIAT DIRECTOR

The world is only going to become more technologically advanced as time passes, especially since we have crossed over to Industry 4.0. Our factories are increasingly being peopled by industrial robots. Offices are increasingly becoming automated. Even our homes are filling up with smart devices. And, sped up by the ensuing COVID-19 pandemic, even learning has shifted to a remote setup.

Now, more than ever, everyone needs to learn not just how to survive but thrive in the virtual realm, making digital citizenship education a must. That said, this research is timely and relevant, as it provides governments and other education stakeholders insights into the digital lives of children in Asia-Pacific.

We hope that publishing the survey results and research findings will help them make the right decisions so they can usher the next generation into the future. We hope that the recommendations we put forth can aid them in creating programmes and projects that will produce digitally competent 21st-century citizens.

In an effort to fulfill our mission to enhance regional understanding and cooperation in education, science, and culture to ensure a better quality of life in Southeast Asia and beyond, we produced this study in cooperation with the United Nations Educational, Scientific and Cultural Organization (UNESCO) and the Korean Republic Funds-in-Trust (KFIT) to benefit not just the featured countries but nations who wish to improve their youth's digital competence.



Dr. Ethel Agnes P. Valenzuela
SEAMEO Secretariat Director

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ACRONYMS AND ABBREVIATIONS

AI	artificial intelligence
APJII	Indonesian Internet Service Providers Association
ASEAN	Association of Southeast Asian Nations
ASI	artificial super intelligence
BEIS	Basic Education Information System
BPS	Statistics Indonesia
CED	Regional Centre for Community Education Development
CFA	confirmatory factor analysis
DepEd	Department of Education
DKAP	Digital Kids Asia-Pacific
GSMA	GSM Association
HDI	Human Development Index
ICT	information and communication technology

IoT	Internet of Things
IP-TIK	Technology, Information and Communication Development Index
IT	information technology
ITU	International Telecommunication Union
KFIT	Korean Republic Funds-in-Trust
MIS	management information system
ML	machine learning
MoEC	Ministry of Education and Culture
MoES	Ministry of Education and Sports
NCR	National Capital Region
NRT	National Research Team
OECD	Organisation for Economic Co-operation and Development
PALI	Penukal Abab Lematang Ilir
PC	personal computer
PDR	People's Democratic Republic
PISA	Programme for International Student Assessment
PNU	Philippine Normal University
Q&A	question-and-answer
RA	Republic Act
SDG	Sustainable Development Goal

SEAMEO	Southeast Asian Ministers of Education Organization
SEM	structural equation modeling
TESDA	Technical Education and Skills Development Authority
TV	television
UN	United Nations
UNBK	Computer-Based National Examination
UNESCO	United Nations Educational, Scientific and Cultural Organization

EXECUTIVE SUMMARY

This Digital Kids Asia-Pacific (DKAP) report presents the results and findings obtained from conducting the DKAP survey among 15-year-old students in Indonesia, Lao People's Democratic Republic (PDR), and the Philippines. It aims to understand what the learners from the three countries know about digital citizenship, how they behave online, and how the Internet and information and communication technology (ICT) tools affect and influence their attitudes and behaviours. It also hopes to determine how digitally competent the 15-year-olds are. Funded by the UNESCO and KFIT, it was prepared and published by the Southeast Asian Ministers of Education Organization (SEAMEO) Secretariat aided by the Ministry of Education and Culture (MoEC) of Indonesia, the Ministry of Education and Sports (MoES) of Lao PDR, the SEAMEO Regional Centre for Community Education Development (CED), the Philippine Normal University (PNU), and the Department of Education (DepEd).

"Insights into the Digital Lives of Children in Indonesia, Lao PDR, and the Philippines" hopes to establish a statistically validated and reliable framework and tool to measure the students' competence to become digital citizens, obtain comprehensive baseline data through a validation study to determine how they use ICT in education, and identify factors that affect their digital citizenship competence through a quantitative survey.

The learners were asked to complete a survey to assess their competence in five domains of digital citizenship—digital literacy, digital security and resilience, digital participation and agency, digital emotional intelligence, and digital creativity and innovation. They were also assessed in terms of their capacity to access the Internet and the necessary ICT tools for education and leisure. Based on the research guidelines the UNESCO established, the online survey questionnaire was distributed to a total of 6,074 15-year-old students throughout Indonesia, Lao PDR, and the Philippines.

In general, the respondents from all three countries are digitally literate and emotionally intelligent. Some, particularly those from Indonesia, however, need more training in protecting themselves online. It is clear that they all need to participate in digital relationships better and

create content that is useful and relevant to others.

To ensure the students become true digital natives who can not only survive in the virtual realm but thrive as 21st-century citizens, the countries' governments need to collaborate with organisations in both the public and private sectors to provide better digital citizenship education, improve their countries' existing ICT infrastructure, enhance ICT training programmes for teachers in training; and conduct further research to monitor progress and development.

Overall, the DKAP survey allows Asia-Pacific countries, such as Indonesia, Lao PDR, and the Philippines, to assess the digital citizenship competence of their students. While much work still needs to be done, this study provides critical information that can serve as baseline data to produce digitally competent learners throughout the region.

INTRODUCTION

Background

The speed at which people can access information through the Internet has made practically everyone reliant on the technology. ICT tools, the cloud, and the Internet of Things (IoT) allow us to stay connected wherever we are. The ensuing COVID-19 pandemic has made connectivity more critical than ever. Strictly imposed lockdowns and establishment closures have pushed us to take work and leisure online.

More than half of the global population access the Internet every day. And 69% of Web users are between 15 and 24 years old. It is not surprising, therefore, that today's economy is driven by technology companies. Many of the Fortune 500 companies are so-called "tech giants," such as Amazon, Apple, Alphabet, Microsoft, and Dell Technologies. Almost 3.6 billion of people worldwide are social media users as of 2020, a number that is expected to grow to 4.4 billion by 2025. The new generation, especially, spend more time on the Internet consuming content compared to reading books and magazines or listening to the radio.

INTERNET USE IN INDONESIA, LAO PEOPLE'S DEMOCRATIC REPUBLIC, AND THE PHILIPPINES

Among the three countries surveyed, Indonesia has the highest number of Internet users.

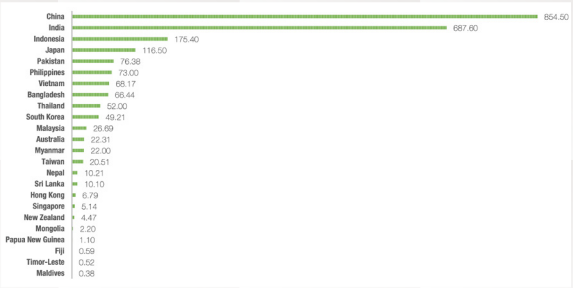

Figure 1: Number of Internet users in Asia-Pacific in 2020

Philippine users, however, spend the most time online at an average of 9 hours and 45 minutes a day. Despite the constantly increasing volume of mobile devices sold, though, 75% of users aged 16–64 still access the Web using their computers.

A 2018 survey by the Indonesian Internet Service Providers Association (APJII) revealed that 65% of Indonesia's total population or 264.2 million people have Internet access. Among those aged 15–19, 91% have Web access.

We Are Social and Hootsuite revealed that 79% of the Lao population have mobile phones and 43% have access to the Internet. The country has 3.1 million active social media users.

The Philippines has 73 million Internet users, accounting for a 67% penetration rate as of January 2020. And more than 90% of them are millennials or belong to Gen Zers.

The Internet usage data and trends have huge implications in delivering education programmes. It is imperative for the countries' ministries of education to obtain relevant and timely information to serve as basis for developing programmes and policies that will respond to the education requirements in the new normal.

INFORMATION AND COMMUNICATION TECHNOLOGY BENEFITS

The Internet and ICT tools have radically changed people's lives. Today's students have a much easier time doing their assignments. They no longer have to physically go to a library for research. They just need to go online and look for information using any of the available search engines and that is it.

Technological advancements are especially welcome amidst the ensuing pandemic, as online learning would not be possible without the Internet and ICT tools. Despite the challenges COVID-19 raised, we need to acknowledge that it did push education stakeholders to migrate to more flexible learning modalities.

In the academe, the Internet and ICT have at least four types of benefits. First, they are sources of knowledge, especially aided by artificial intelligence (AI). Second, they serve as learning aids. Teachers can use ICT tools to create examinations and interactive learning videos and communicate even over long distances with their students. Third, they function as learning aids, especially today for independent learning. Fourth, the Internet serves as a digital archive for storing all kinds of learning materials.

INFORMATION AND COMMUNICATION TECHNOLOGY CHALLENGES

While technological advances have made life easier for students and the world in general, Internet access and ICT tool usage also have their downsides.

Overexposure to social media, for instance, leave youngsters exposed to inappropriate content. The ease by which anyone, even the underaged, can create accounts has left the youth exposed to adult content and fake news. Spending too much time on social networks can also have adverse effects on their studies, not to mention leave them prone to fraud, identity theft, and cyberbullying.

And since anyone with Internet access can find all kinds of reference materials online, some students become lazy and instead of, say, crafting their own content just resort to plagiarism. While digital resources, such as Brainly, a platform for knowledge sharing with around 200 million student and education expert members around the world, are not meant to encourage laziness, they are sometimes misused.

A more critical issue has to do with user privacy. Some 64% of Internet users are concerned about how advertisers use their personal data. That is, of course, not surprising, given the proliferation of cyberthreats, such as phishing, data breaches, and malware infections, online. The volume of unsolicited ads that people receive has, in fact, led many to install ad-blocking software on their devices. Add to that the amount of personal information that smart devices at home and work collect.

The digital divide is also worth noting. The Technical Education and Skills Development Authority (TESDA), for instance, stated that the Philippines still pales in comparison with other nations in terms of personal computer (PC) ownership. Not everyone can afford to have a PC at home. The Philippines's Internet access speed also lags behind other more developed Southeast Asian nations'. The

country sits at the bottom 50% of the global ICT development index.

DepEd also believes the Philippines needs to improve its students' digital literacy. Filipino children need to develop a whole new range of ICT-related skills if they are to thrive in a digital economy. They have yet to master using ICT tools for their studies.

What Digital Citizenship Entails According to Digital Kids Asia-Pacific

Our postmodern world is riddled by using increasingly advanced technologies, such as artificial super intelligence (ASI), cloud computing, machine learning (ML) algorithms, robotics, and data analytics, among others. Industry 4.0 ushered in supercomputers that are always connected and communicate with one another, even making decisions for us. Smart devices are getting smarter so long as they can access big data. Factories have become more efficient and productive and less wasteful. Even our social lives were radically morphed. Regardless of one's role in life—employee or student—everyone needs to acquire the necessary digital skills to successfully adapt to the ever-evolving world.

Amidst the ensuing COVID-19 pandemic, national governments are redefining, redirecting, and reevaluating their citizens' digital capabilities to invest more in educating people to enhance their digital literacy. Educational institutions now have to face tougher challenges to come up with high-quality and effective programmes to improve students' digital skills, especially amidst lockdowns and school closures. We saw a significant paradigm shift on how teaching and learning occurs. A majority of today's students had to shift to remote learning. Ironically, the pandemic expedited ICT use in education, making the need for digital citizenship education a must.

DEFINING DIGITAL CITIZENSHIP

Digital citizenship, according to UNESCO, refers to the ability to find, access, use, and create information effectively; engage with other users and content in an active, critical, sensitive, and ethical manner; and navigate the online and ICT environments safely and responsibly, while being aware of one's own rights.

DIGITAL CITIZENSHIP DOMAINS

In 2019, UNESCO conducted the first DKAP study to understand the state of digital citizenship among children in the region. The research investigated students' competence in five domains—digital literacy, digital safety and resilience, digital participation and agency, digital emotional intelligence, and digital creativity and innovation.

Digital Literacy

Digital literacy, in the DKAP context, means that students can seek out,

critically evaluate, and use digital tools and information effectively to make informed decisions. That translates to promoting ICT and information literacy. Just as the Organisation for Economic Co-operation and Development (OECD) believes that machines and ICT infrastructures are useless without the competence to exploit them, schools and colleges should nurture digital literacy among their students, as that serves as the foundation for lifelong learning. To become digitally literate, an individual must be able to successfully manage hardware and software and use ideas and information to make the right decisions.

Digital Safety and Resilience

Digital safety and resilience in children means the ability to protect themselves from any kind of harm online. Specifically, the students must know their legal rights, be conscious when sharing information online, respect others' privacy, maintain a healthy well-being, and be proactive when dealing with different challenges.

Digital Participation and Agency

Children adept in digital participation and agency can use ICT tools to engage in positive interactions. This domain entails collaborating well with others online to achieve a common goal. This collaboration must extend to civic activities. The students must also demonstrate ethical and courteous behaviours when dealing with others. That may require national governments to strengthen existing education systems, build up knowledge dissemination infrastructures, improve access to information, and provide high-quality and effective learning and more effective services.

Digital Emotional Intelligence

Digital emotional intelligence implicates the desire to eliminate the digital divide. Lack of access to advanced technologies continues to be a barrier to effectively educating the world's youth. Nations need to narrow the gap by providing universal access to computers and the Internet, establishing community Internet access centres, training additional technical staff, and ushering in a paradigm shift in the way people perceive technology. We need to promote equity and inclusivity through digital citizenship education to turn students into emotionally intelligent adults. They must be made aware of the physiological changes their bodies will undergo, understand the complexities of their behaviours and emotions, and recognise the factors that can help them achieve their goals. They should understand themselves, while understanding others.

Digital Creativity and Innovation

As the 2020 World Economic Forum put it, the social and economic impact of technology is widespread and accelerating. The speed at which we access and the volume of information have increased exponentially, which children can take advantage of in creative and responsible ways. That is the aim of turning students into digitally creative and innovative individuals. They need to learn to craft digital content that is relevant and useful to others.

6 Insights into the **Digital Lives of Children** in Indonesia, **Lao People's Democratic Republic,** and the **Philippines**

WHAT THE DIGITAL KIDS ASIA-PACIFIC STUDY AIMS TO DO FOR INDONESIA, LAO PEOPLE'S DEMOCRATIC REPUBLIC, AND THE PHILIPPINES

Assessing the three countries' students on the five domains of digital citizenship will help them address gaps in national education curricula to improve digital citizenship education. In that case, the DKAP project is a timely and appropriate step towards providing evidence-based data to help Asia-Pacific countries develop programmes to effectively respond to the challenges the 21st century will pose.

Research Objectives

The DKAP study in Indonesia, Lao PDR, and the Philippines aims to:

- Establish a statistically validated and reliable framework and tool to measure their students' competence to become digital citizens
- Obtain comprehensive baseline data through a validation study to determine how their students use ICT in education
- Identify factors that affect their students' digital citizenship competence

This research specifically aims to answer the question: Can the DKAP survey measure the digital competence of students in Asia-Pacific? It hopes to answer these questions:

- What criteria can measure students' digital competence?
- Are the DKAP survey results valid and reliable?
- How do individual characteristics, such as gender, family background, school, and local community, influence the digital competence of 15-year-old students?
- What conclusions can be drawn about the 15-year-olds' digital competence?

INSIGHTS INTO THE DIGITAL LIVES OF CHILDREN IN INDONESIA

Research Methodology

"Insights into the Digital Lives of Children in Indonesia" is, based on the guidelines UNESCO set for the DKAP project, a quantitative study that uses an online survey as a means to collect data on Internet and ICT tool usage among 15-year-old students. Funded by UNESCO and KFIT, it was conducted by MoEC, specifically Ferdi Widiputera, Novrian Satria Perdana, and Irsyad Zamjani.

This section describes the methodology the research team used, including a profile of the survey sample and the sampling, data collection, and statistical validation processes they utilised. Note that the results and findings were validated by various stakeholders, including the researchers, national research experts, the DKAP project team members, and their partners. Research limitations and challenges are presented here as well.

SURVEY SAMPLE

As per UNESCO requirements, this study surveyed 15-year-old students from Indonesia. The sample was limited to this age group for the following reasons:

- It responds to the Sustainable Development Goal (SDG) to raise the proportion of youth and adults with ICT skills. The study's target age group is appropriate because the United Nations (UN) defines the youth as those aged between 15 and 24.
- Given the different stages of ICT development in Asia-Pacific, strategically targeting older children can reduce potential gaps in access to and use of digital devices in the short term.
- Processing the responses of younger children will take more time and effort on the part of the researchers, as 15-year-olds may no longer need parent or guardian supervision.

SAMPLING METHOD

Due to Indonesia's large 15-year-old population, multistage random sampling was used to obtain a representative sample. The researchers utilised a combination of two or more different sampling methods. In each stage, a smaller sample was randomly chosen from the total population until a representative set was produced.

Obtaining the sample for this study began by randomly choosing half the number of the total number of provinces in the country. Indonesia has 34 provinces. This number was reduced to 18 and equitably divided across the three Technology, Information and Communication Development Index (IP-TIK) categories. IP-TIK, of course, is the standard for measuring a province's level of ICT development. The 18 provinces chosen to participate in the survey are shown below.

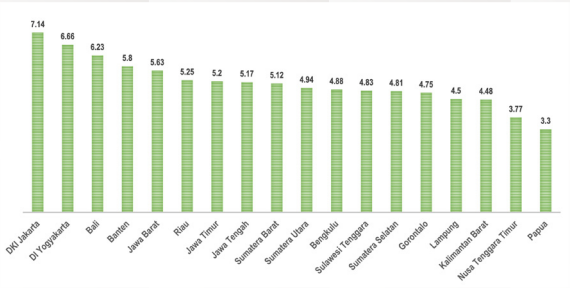

Figure 2: 18 Indonesian provinces chosen to participate in the survey

From the 18 provinces, the researchers used the Human Development Index (HDI) compiled by Statistics Indonesia (BPS) to select a representative sample of districts and cities to obtain data reflecting the situations in rural and urban areas. One district and one city from each rural and urban area per province were chosen. A total of 18 districts and 18 cities comprised the sample shown below.

Table 1: Districts and Cities That Comprised the Study Sample

Province	District/City
DKI Jakarta	Jakarta Selatan Jakarta Utara
DI Yogyakarta	Kota Yogyakarta Kab. Gunung Kidul
Bali	Kota Denpasar Kab. Karangasem
Banten	Kota Tangerang Selatan Kab. Lebak
Jawa Barat	Kota Bogor Kab. Cianjur
Riau	Kota Pekanbaru Kab. Indragiri Hilir
Jawa Timur	Kota Surabaya Kab. Sampang
Jawa Tengah	Kota Semarang Kab. Brebes
Sumatera Bar-at	Kota Padang Kab. Pasaman
Sumatera Utara	Kota Medan Kab. Nias Barat
Bengkulu	Kota Bengkulu Kab. Kaur
Sulawesi Tenggara	Kota Kendari Kab. Buton Tengah
Sumatera Selatan	Kota Palembang Kab. Penukal Abab Lematang Ilir (PALI)
Gorontalo	Kota Gorontalo Kab. Gorontalo Utara
Lampung	Kota Bandar Lampung Kab. Tulang Bawang Barat
Kalimantan Barat	Kota Pontianak Kab. Sekadau
Nusa Tenggara Timur	Kota Kupang Kab. Sabu Raijua
Papua	Kota Jayapura Kab. Nduga

The schools were chosen next. Two schools with the highest Computer-Based National Examination (UNBK) rankings in 2019—one public senior high school and one public vocational high school—were chosen from each district and city. That provided a list of 72 schools listed below.

Table 2: Schools That Participated in the Survey			
Province	**District/City**	**Classification**	**School Name**
Bali	Kab. Karang Asem	Public vocational high school	SMK Negeri 1 Amlapura
Bali	Kab. Karang Asem	Public senior high school	SMA Negeri 2 Amlapura
Bali	Kota Denpasar	Public vocational high school	SMK Negeri 2
Bali	Kota Denpasar	Public senior high school	SMA Negeri 1
Banten	Kab. Lebak	Public vocational high school	SMK Negeri 1 Cibeber
Banten	Kab. Lebak	Public senior high school	SMA Negeri 1 Rangkasbitung
Banten	Kota Tangerang Selatan	Public vocational high school	SMK Negeri 4
Banten	Kota Tangerang Selatan	Public senior high school	SMA Negeri 2
Bengkulu	Kab. Kaur	Public vocational high school	SMK Negeri 7 Kaur
Bengkulu	Kab. Kaur	Public senior high school	SMA Negeri 5 Kaur
Bengkulu	Kota Bengkulu	Public vocational high school	SMK Negeri 1
Bengkulu	Kota Bengkulu	Public senior high school	SMA Negeri 5
DI Yogyakarta	Kab. Gunung Kidul	Public vocational high school	SMK Negeri 1 Wonosari
DI Yogyakarta	Kab. Kulon Progo	Public vocational high school	SMK Negeri 1 Pengasih
DI Yogyakarta	Kota Yogyakarta	Public vocational high school	SMK Negeri 1
DI Yogyakarta	Kota Yogyakarta	Public senior high school	SMA Negeri 3
DKI Jakarta	Kota Jakarta Selatan	Public vocational high school	SMK Negeri 20
DKI Jakarta	Kota Jakarta Selatan	Public senior high school	SMA Negeri 8
DKI Jakarta	Kota Jakarta Utara	Public senior high school	SMA Negeri 13
DKI Jakarta	Kota Jakarta Utara	Public vocational high school	SMK Negeri 12
Gorontalo	Kab. Gorontalo Utara	Public vocational high school	SMK Negeri 2 Gorontalo Utara

Table 2: Schools That Participated in the Survey			
Province	**District/City**	**Classification**	**School Name**
Gorontalo	Kab. Gorontalo Utara	Public senior high school	SMA Negeri 7 Gorontalo Utara
Gorontalo	Kota Gorontalo	Public senior high school	SMA Negeri 3
Gorontalo	Kota Gorontalo	Public vocational high school	SMK Negeri 1
Jawa Barat	Kab. Cianjur	Public vocational high school	SMK Negeri 1 Cianjur
Jawa Barat	Kab. Cianjur	Public senior high school	SMA Negeri 1 Sukaresmi
Jawa Barat	Kota Bogor	Public vocational high school	SMK Negeri 3
Jawa Barat	Kota Bogor	Public senior high school	SMA Negeri 1
Jawa Tengah	Kab. Brebes	Public vocational high school	SMK Negeri 1 Brebes
Jawa Tengah	Kab. Brebes	Public senior high school	SMA Negeri 1 Bumiayu
Jawa Tengah	Kota Semarang	Public senior high school	SMA Negeri 3
Jawa Tengah	Kota Semarang	Public vocational high school	SMK Negeri 2
Jawa Timur	Kab. Sampang	Public senior high school	SMA Negeri 1 Sampang
Jawa Timur	Kab. Sampang	Public vocational high school	SMK Negeri 1 Sampang
Jawa Timur	Kota Surabaya	Public senior high school	SMA Negeri 5
Jawa Timur	Kota Surabaya	Public vocational high school	SMK Negeri 1
Kalimantan Barat	Kab. Sekadau	Public vocational high school	SMK Negeri 1 Nanga Taman
Kalimantan Barat	Kab. Sekadau	Public senior high school	SMA Negeri 1 Sakadau
Kalimantan Barat	Kota Pontianak	Public senior high school	SMA Negeri 1
Kalimantan Barat	Kota Pontianak	Public vocational high school	SMK Negeri 3
Lampung	Kab. Tulang Bawang Barat	Public vocational high school	SMK Negeri 1 Tulang Bawang Tengah
Lampung	Kab. Tulang Bawang Barat	Public senior high school	SMA Negeri 1 Tumijajar

Table 2: Schools That Participated in the Survey			
Province	**District/City**	**Classification**	**School Name**
Lampung	Kota Bandar Lampung	Public senior high school	SMA Negeri 2
Lampung	Kota Bandar Lampung	Public vocational high school	SMK Negeri 1
Nusa Tenggara Timur	Kab. Sabu Raijua	Public senior high school	SMA Negeri 1 Raijua
Nusa Tenggara Timur	Kab. Sabu Raijua	Public vocational high school	SMK Negeri 1 Sabu Barat
Nusa Tenggara Timur	Kota Kupang	Public senior high school	SMA Negeri 3
Nusa Tenggara Timur	Kota Kupang	Public vocational high school	SMK Negeri 1
Papua	Kab. Nduga	Public vocational high school	SMK Negeri 1 Kenyam
Papua	Kab. Nduga	Public senior high school	SMA Negeri 1 Kenyam
Papua	Kota Jayapura	Public senior high school	SMA Negeri 4
Papua	Kota Jayapura	Public vocational high school	SMK Negeri 1
Riau	Kab. Indragiri Hilir	Public vocational high school	SMK Negeri 1 Tembilahan
Riau	Kab. Indragiri Hilir	Public senior high school	SMA Negeri 1 Tembilahan Hulu
Riau	Kota Pekanbaru	Public vocational high school	SMK Negeri 1
Riau	Kota Pekanbaru	Public senior high school	SMA Negeri 8
Sulawesi Tenggara	Kab. Buton Tengah	Public vocational high school	SMK Negeri 2 Mawasangka
Sulawesi Tenggara	Kab. Buton Tengah	Public senior high school	SMA Negeri 2 Talaga Raya
Sulawesi Tenggara	Kota Kendari	Public vocational high school	SMK Negeri 1
Sulawesi Tenggara	Kota Kendari	Public senior high school	SMA Negeri 1
Sumatera Barat	Kab. Pasaman	Public vocational high school	SMK Negeri 1 Lubuk Sikaping
Sumatera Barat	Kab. Pasaman	Public senior high school	SMA Negeri 1 Lubuk Sikaping

Table 2: Schools That Participated in the Survey			
Province	**District/City**	**Classification**	**School Name**
Sumatera Barat	Kota Padang	Public vocational high school	SMK Negeri 3
Sumatera Barat	Kota Padang	Public senior high school	SMA Negeri 1
Sumatera Selatan	Kab. Penukal Abab Lematang Ilir	Public vocational high school	SMK Negeri 1 Talang Ubi
Sumatera Selatan	Kab. Penukal Abab Lematang Ilir	Public senior high school	SMA Negeri 2 Unggulan
Sumatera Selatan	Kota Palembang	Public vocational high school	SMK Negeri 6
Sumatera Selatan	Kota Palembang	Public senior high school	SMA Negeri 6
Sumatera Utara	Kab. Nias Barat	Public senior high school	SMA Negeri 1 Moro'o
Sumatera Utara	Kab. Nias Barat	Public vocational high school	SMK Negeri 2 Ulu Moro'o
Sumatera Utara	Kota Medan	Public senior high school	SMA Negeri 1
Sumatera Utara	Kota Medan	Public vocational high school	SMK Negeri 11

Finally, 30 students were selected randomly from each school.

A total of 3,600 survey questionnaires were distributed throughout Indonesia.

DATA COLLECTION

The questionnaire was translated into Indonesian then distributed to Provincial Education Offices, which served as regional coordinators. The link to the online survey was also disseminated to school principals. Each principal appointed a teacher to choose the students who then served as survey respondents.

The researchers monitored submissions daily to ensure the completeness and quality of the survey responses. Errors were corrected. Principals and the Provincial Education Offices responsible for students who failed to submit their filled-up questionnaires were notified.

The researchers also provided a question-and-answer (Q&A) platform on WhatsApp for clarifications.

RESEARCH LIMITATIONS AND CHALLENGES

While the endeavor was a success, the researchers did stumble into a number of

limitations.

First, the sample size does not fully represent the entire population of the districts (i.e., rural areas) and cities (i.e., urban areas). To address this issue, the researchers standardised the sampling process to reduce errors. It did, however, meet UNESCO's required minimum number of students (i.e., 1,000) from 20 schools. The total number of respondents, in fact, was thrice that number.

Second, since the students surveyed were all around 15 years old, the results and research findings may not fit the situation of younger or older learners. It is, after all, normal for behaviours and interaction patterns to change with age.

Third, the students' competence were measured based on their respective perceptions using a four-point Likert scale. While the teachers and principals did give them an overview of the study and discussed the questions, they still could have misunderstood or misinterpreted some content.

Survey Results and Research Findings

The survey questionnaire contained a combination of closed and open-ended questions. The students can choose one from among four possible answers to each closed question—strongly disagree (equivalent to 1 point), disagree (equivalent to 2 points), agree (equivalent to 3 points), and strongly agree (equivalent to 4 points).

To determine the students' overall score for each domain, the researchers obtained the mean score, which translates to five ratings shown below.

Table 3: Mean Score Interpretations

Mean Score	Interpretation
1.00–1.60	Very poor
1.61–2.20	Poor
2.21–2.80	Satisfactory
2.81–3.40	Good
3.41–4.00	Very good

The respondents were given the freedom to state their answers for open-ended questions. Identical answers were pooled together to generalise results.

The students assessed their competence in the five domains and provided data that allowed the researchers to create their general profile in terms of access to the Internet and ICT tools, online behaviours, and socioeconomic status, among others.

DIGITAL LITERACY

The students were asked 14 closed questions to determine if they were digitally literate.

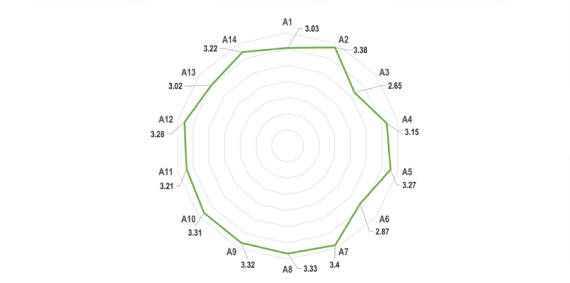

Figure 3: Students' mean score for digital literacy

The 15-year-olds scored 3.17 overall for digital literacy. That translates to a good rating. They need further training, however, to access the Internet more securely to avoid dangers, such as falling for fake news. They would also do well to learn to remove malware from their devices or install and use antimalware, as they only scored 2.65 for this subcompetence. That is critical, especially since anyone could be the next cyber attack victim. In most instances, the students' devices came preinstalled with antimalware.

DIGITAL SAFETY AND RESILIENCE

The students were asked 14 closed and four open-ended questions to determine if they were competent in terms of digital safety and resilience.

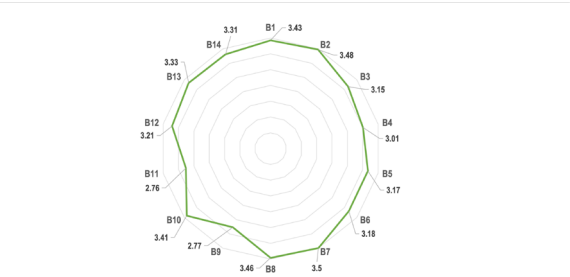

Figure 4: Students' mean score for digital safety and resilience

The students garnered an overall mean score of 3.23 for digital safety and resilience.That translates to a good rating. Of the 14 open-ended questions, they got a very good rating for five questions, a good rating for seven questions, and a satisfactory rating for two questions. As such, they need to learn how to minimise risks, such as cyberbullying, when going online.

When asked how they would react if they get exposed to disturbing content, the majority of the students said they would immediately leave the site or delete an offending file (81%). More than half also stated they would block the website (54%).

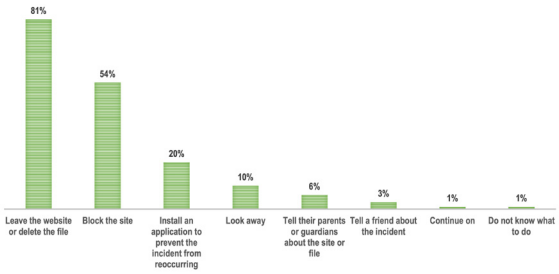

Figure 5: What the students would do in case of exposure to disturbing content

When questioned how they would react if they received unwanted, annoying, or disturbing messages or embarrassing pictures from a known contact, most of the students said they would block and report the person to the authorities (44%). The same number of respondents said they would remove the person from their contact lists. Some 39% would ask the contact to stop sending such messages or pictures, while 36% would just ignore the messages or pictures and their sender.

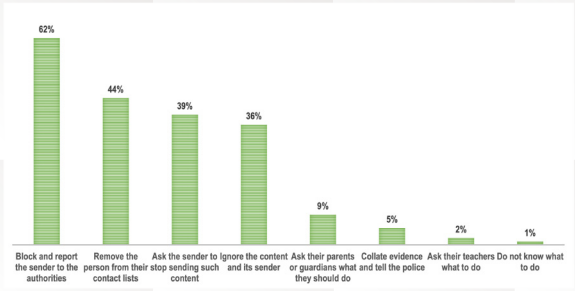

Figure 6: What the students would do if a known contact sends them disturbing content

When asked how they would react if they found their personal information misused, compromised, or acquired without their permission, the majority of the students said they would review their privacy settings and choose stronger passwords (66%), while 65% said they would change their account credentials.

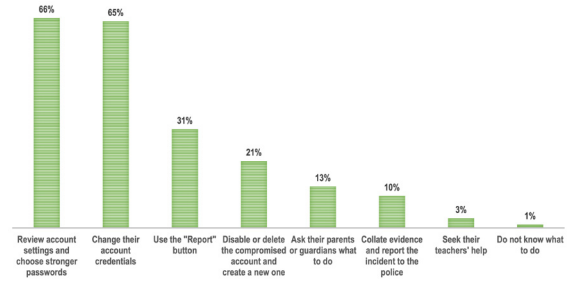

Figure 7: What the students would do if their personal data has been misused, compromised, or acquired without their permission

Finally, when questioned what they would do if they got bullied online by friends or other people, 49% said they would collate evidence, such as screenshots, while 43% said they would not let the bullies know they were bothered and just ignore the incidents.

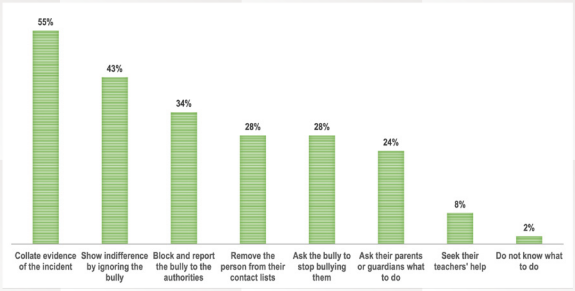

Figure 8: What the students would do if they get bullied online

DIGITAL PARTICIPATION AND AGENCY

The students were asked 12 closed questions to determine their competence for digital participation and agency.

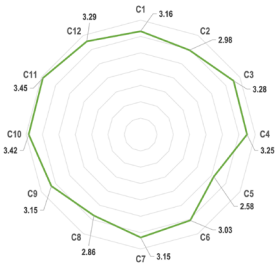

Figure 9: Students' mean score for digital participation and agency

The 15-year-olds got an overall mean score of 3.13, which translates to a good rating. Of the 12 closed questions, they scored very good for two questions and satisfactory for one question. Since prolific use of the Internet, especially for accessing social media, has advantages and disadvantages, teachers can work with the students' parents or guardians to monitor them. A study once revealed that spending too much time on social networks can be addicting. In other cases, it can cause the students to become anti-social in the real world. Worse, however, they can become lazy and forgo

doing chores or focus on their studies just so they could spend more time interacting on social media. But not all of the effects of immersing oneself in social networks are bad. A study, in fact, found that doing so can improve students' writing skills. At the end of the day, the children just need to strike a balance between interacting online and offline.

DIGITAL EMOTIONAL INTELLIGENCE

The students were asked 16 closed questions to determine if they demonstrate emotional intelligence online.

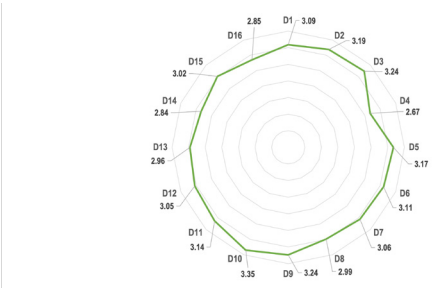

Figure 10: Students' mean score for digital emotional intelligence

The respondents garnered a mean score of 3.06, which translates to a good rating. Of the 16 questions, they only scored low for one question.

DIGITAL CREATIVITY AND INNOVATION

The students were asked 11 closed questions to determine if they are digitally creative and innovative.

Figure 11: Students' mean score for digital creativity and innovation

The 15-year-olds obtained an overall mean score of 2.73 for digital creativity and innovation. That translates to a satisfactory rating. As such, they are quite passive when going online. They can improve if curricula would include coding or programming as subjects. That would prepare them for Industry 4.0. To date, the government has included this in its future plans in hopes of churning out graduates who can develop AI systems and IoT devices in the future.

STUDENT PROFILE

There were more female (68%) than male (32%) survey respondents.

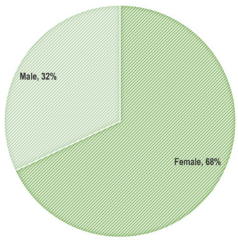

Figure 12: Students' genders

By the time the analysis was completed, 13% of the respondents turned 16.

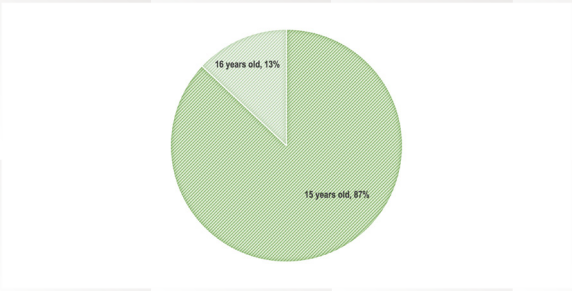

Figure 13: Students' ages upon research completion

The majority of the respondents were in grade 10 (82%), while the remaining 18% were in grade 11.

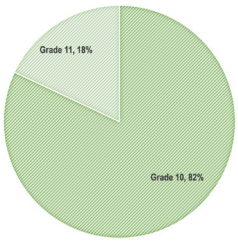

Figure 14: Students' grade levels

When asked what they thought their highest educational attainment would be, most of the students hoped to get masters or even doctorate degrees (28%). They have high aspirations and are motivated to learn as much as they can.

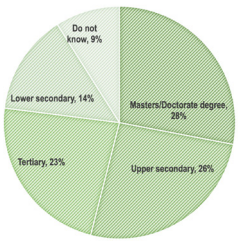

Figure 15: Highest educational attainment the students hope to obtain

When asked how much time they usually spend on daily activities outside school, 12% said they utilised more than 7 hours helping family members do household chores. They also spend much time (i.e., about 3 hours) doing homework or studying.

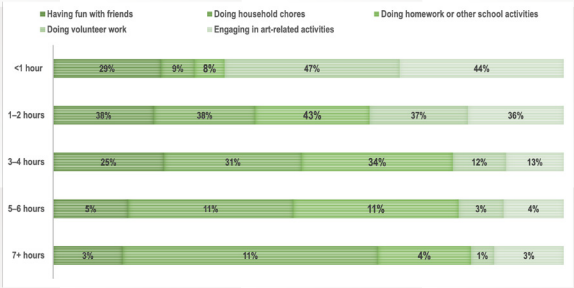

Figure 16: Time students spent on daily activities outside school

DIGITAL DEVICE ACCESS AND USAGE

Access to and usage of digital devices affect the students' digital competence. As shown below, the majority of the respondents have been using digital devices for more than five years now (40%). These learners could mentor others. It is, however, also evident that many have only been using digital devices for a year or less (11%).

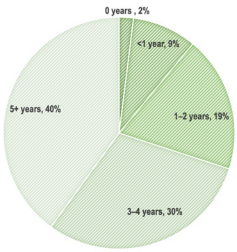

Figure 17: Total amount of time spent using digital devices

When asked how much time they spend accessing the Internet and using digital devices daily, most of the students replied seven or more hours daily (33%).

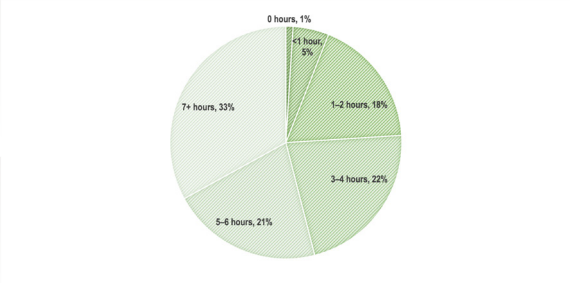

Figure 18: Time spent on accessing the Internet and using digital devices daily

The respondents who access the Internet and use digital devices for seven hours or more daily did so at home. That iterates the role that parents or guardians should play in monitoring them so they can stay safe from cyberthreats. Many students also access the Web and use digital devices in school and local community centres.

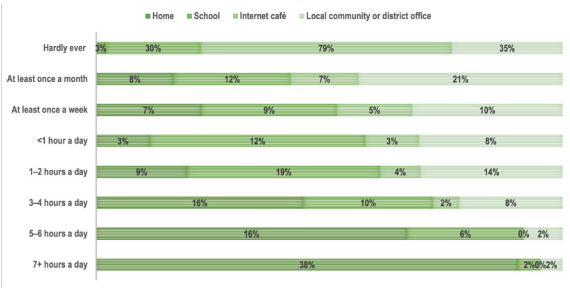

Figure 19: Location where students typically access the Internet

When asked what tools they use to access the Internet, most students who go online at home replied smartphones (92%), while 58% said they use laptops. Those who access the Web most in school use smartphones (63%), followed by desktops (48%).

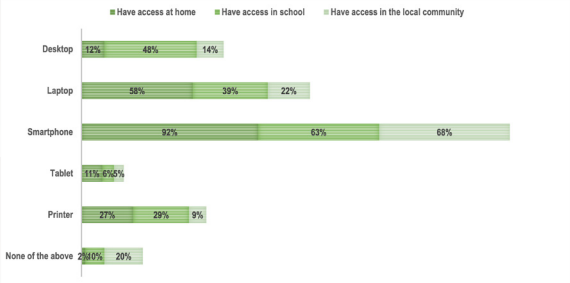

Figure 20: Tools students use to access the Internet

The majority of students who have Internet access at home use wireless connection (63%). The same was true for those who access the Web in school (72%) and local community centres (67%).

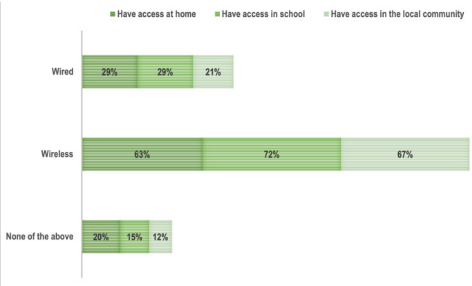

Figure 21: Internet connection type

Most of the respondents learned to use computers on their own (35%). The same was true when they were asked who taught them how to access the Internet (64%). Given these, formal computer education should focus on training students to do more complex computing tasks, such as programming, coding, and using AI.

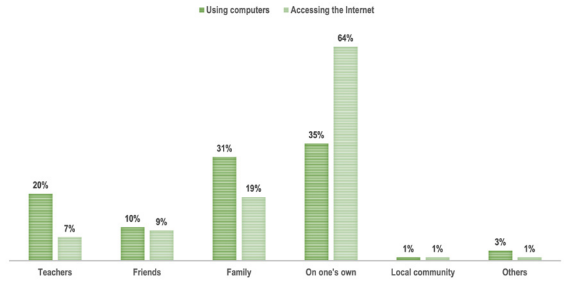

Figure 22: Who students learned about using computers and the Internet from

When asked how much time they spend accessing the Internet for various activities daily, most said they spend seven hours or more on the computer for schoolwork (34%). The greatest number of students who go online for personal purposes typically spend 1–2 hours daily (44%). The majority who access the Web for leisure do so 1–2 hours daily (31%) as well. Finally, most of the learners who go online to socialise do so usually for 1–2 hours a day (31%).

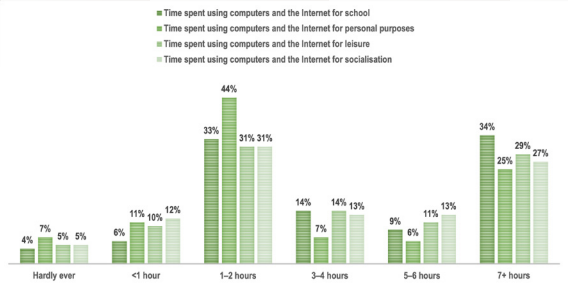

Figure 23: Frequency of computer and Internet use daily

SOCIOECONOMIC STATUS

Since access to the Internet and digital devices affect students' digital competence, it is not surprising to see that socioeconomic status has a lot to do with it as well.

When asked who they lived with, the majority of the respondents replied their mothers (76%), followed by their fathers and siblings (65%).

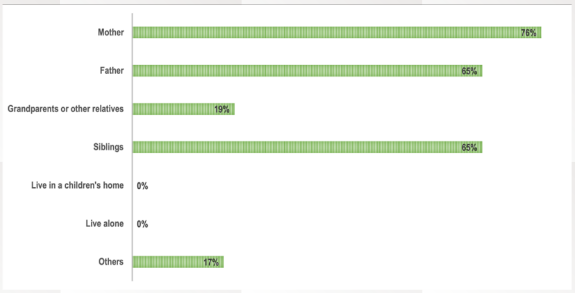

Figure 24: Who the students live with

When asked what their parents' highest educational attainment are, most of the respondents said their fathers (39%) and mothers (38%) were upper-secondary graduates.

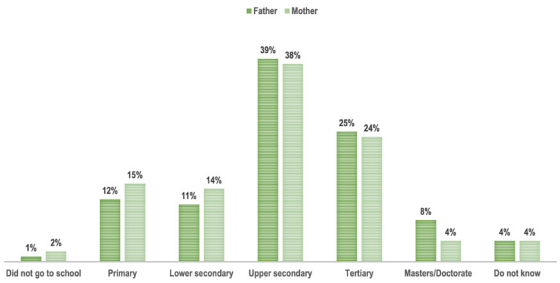

Figure 25: Highest educational attainment of students' parents

When asked if they have any of the facilities in the list, 37% said they had cars, 95% said they had TV sets, and 30% said they had bathrooms with a tub or shower.

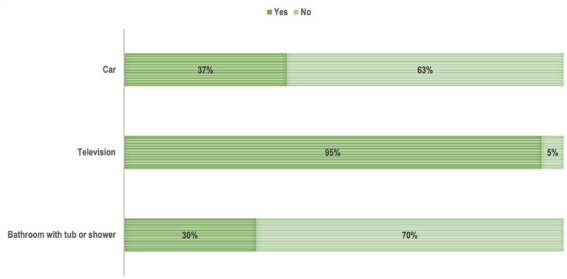

Figure 26: Facilities the students' families own

When asked if they own books, the majority of the respondents owned between 26 and 100 books (28%).

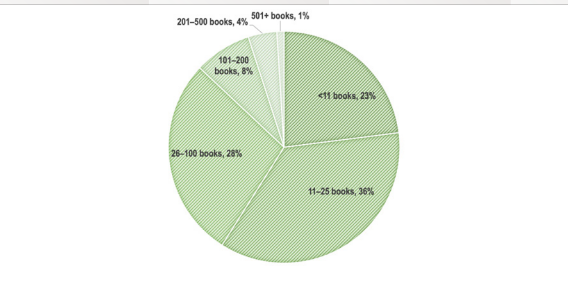

Figure 27: Book ownership

When queried how often certain people tell them to access the Internet safely, 52% said their peers sometimes do. Others said their siblings (48%), teachers (56%), and parents (42%) also warn them sometimes.

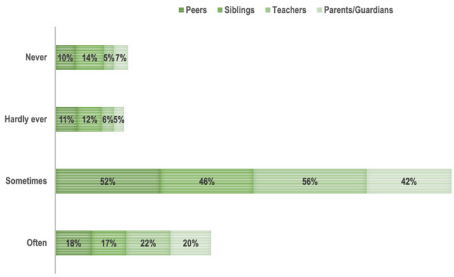

Figure 28: Frequency people tell the students to access the Internet safely

When asked who encourage them to learn things from the Internet, the students said their peers (52%), siblings (47%), teachers (53%), and parents or guardians (45%) do sometimes.

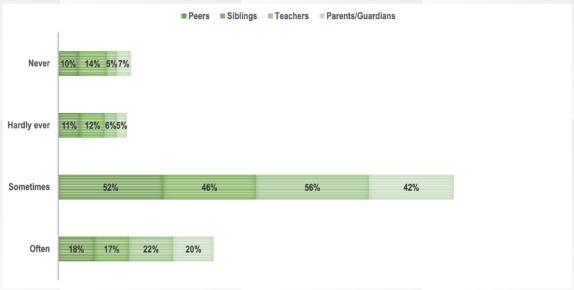

Figure 29: Frequency people encourage the students to learn things from the Internet

INSIGHTS INTO THE DIGITAL LIVES OF CHILDREN IN LAO PEOPLE'S DEMOCRATIC REPUBLIC

Research Methodology

"Insights into the Digital Lives of Children in Lao PDR" is, based on the guidelines UNESCO set for the DKAP project, a quantitative study that uses an online survey as a means to collect data on Internet and ICT tool usage among 15-year-old students. Funded by UNESCO and KFIT, it was conducted by PNU and SEAMEO CED.

This section describes the methodology the research team used, including a profile of the survey sample and the sampling, data collection, and statistical validation processes they utilised. Note that the results and findings were validated by various stakeholders, including the researchers, national research experts, the DKAP project team members, and their partners. Research limitations and challenges are presented here as well.

SURVEY PREPARATION

The survey questionnaire was translated from English to Lao by the National Research Team (NRT) via the back-translation method. The translated DKAP survey instrument was then piloted in a school in Vientiane among 50 participants. The results of the pilot survey were then analysed to see if the target respondents can answer the questions well.

SAMPLING METHOD

Participating schools were chosen from each geographical division of Lao PDR—North, Central, and South—to ensure a balanced representation of the country's youth population. Luang Prabang represented the north, Vientiane the central part, and Savannakhet the south. Target schools were selected through a purposive sampling approach after consultations with the Provincial Department of Education and Sports. All of the chosen institutions were public schools. One school each from an urban, a semi-urban, and a rural area was selected from each province. A total of nine schools participated in the survey.

Three data collection teams with three members each took care of a geographical division. A total of 1,288 15-year-old students responded to the survey, 55% of whom are girls.

DATA COLLECTION

A two-day data collection training was organised for the nine survey administrators. The research background was discussed.

Printed questionnaires were distributed to the students. Each student spent 40–50 minutes to complete the survey. Their responses were then encoded into an Excel file for analysis.

SURVEY RESULTS RELIABILITY AND VALIDITY

One of the goals of this study is to determine if the DKAP survey questionnaire is a reliable and valid instrument. For this purpose, the researchers obtained Cronbach's alpha to determine if each domain's primary

competency was consistent with its subcompetencies. The values obtained for the domains ranged from 0.68 to 0.80, which indicate consistency. Those for the subcompetencies, meanwhile, ranged from 0.39 to 0.75, which are acceptable. Given these results, the DKAP survey is reliable.

To assess the validity of the DKAP survey, a confirmatory factor analysis (CFA) using structural equation modeling (SEM) was performed on the data collected. CFA was performed on each domain with its subcompetencies as latent variables and their corresponding items as observed variables. Overall, the results indicated that all five domains were a good model fit even if digital literacy obtained a less than satisfactory fit. All domains scored great in terms of their hypothesised latent factors with standardised parameter estimates ranging from 0.20 to 0.73. Moreover, the standardised parameter estimates were all above 0.50. Overall, the CFA results proved the validity of the DKAP survey.

DATA ANALYSIS

The responses were analysed by determining frequencies, percentage scores, mean scores, and standard deviations to ascertain the students' digital citizenship competence. When applicable, some responses were reverse-coded.

A series of independent sample t-tests were conducted to identify differences in the participants' digital citizenship competency scores due to gender, school type, and location. Afterwards, a series of multiple regression analyses were performed to see if a set of personal and contextual factors affect the students' competence in each domain. To account for shared variances, all hypothesised predictor variables were subjected to the multiple regression model simultaneously.

RESEARCH LIMITATIONS AND CHALLENGES

The researchers were ethical, especially during the data collection phase. They made sure that the students' parents or guardians gave their consent to participate in the survey. The participants were also given the freedom to choose if they would participate or not. And since the survey was conducted online, the respondents were not exposed to COVID-19. The students did not even need to give their names and were instead identified by identification numbers. Only the researchers involved in data coding and analysis had access to their personal data.

As with other studies, this research had limitations, including:

- Since the survey relied on the students' self-perception, the results may be biased. Some respondents may have also misunderstood a number of questions.
- The sample size may not be representative of the entire 15-year-old population of Lao PDR, especially since purposive sampling was used. As such, caution should be exercised when generalising the survey results.
- While all the competencies proved consistent with their subcompetencies, it may be more useful to use the findings for the competencies instead of those

for the subcompetencies to describe the children's digital citizenship competence.

- Not all of the possible personal and contextual variables were considered in the survey. Some unidentified variables could have a greater impact on the respondents' digital citizenship competence. Moreover, while the researchers used correlation techniques, the analysis may not support cause-and-effect relationships. As such, the predictive effects of the factors are indicative of correlation and not causality.

Survey Results and Research Findings

Apart from determining if the DKAP survey measures the digital citizenship competence of Asia-Pacific students, this study also aims to measure how digitally competent Lao students are.

In general, the results showed that the respondents were good digital citizens, as evidenced by their mean scores for four of the five domains.

Table 4: Student's Overall Mean Scores

Domain	Mean Score	Standard Deviation
Digital literacy	3.21	0.42
Digital safety and resilience	3.28	0.38
Digital participation and agency	3.12	0.40
Digital emotional intelligence	3.06	0.41
Digital creativity and innovation	2.79	0.51

Table 4: Student's Overall Mean Scores

The survey results revealed that the students got the highest mean score for digital safety and resilience and the lowest for digital creativity and innovation.

We Are Social and Hootsuite stated that 56% of the Lao population are on social media, such as Facebook. The children's high mean score for digital safety and resilience showed they stay safe online. Compared with the four countries in the first survey, Lao PDR scored lower than Bangladesh, which got the lowest rating for digital safety and resilience. That should push policymakers to develop programmes that promote safety and resilience online.

The children need to improve in terms of digital creativity and innovation as well. With increasing Internet use in the country, they need to be taught to creatively express themselves.

GENDER AND OTHER CONTEXTUAL AND PERSONAL FACTORS THAT AFFECT DIGITAL CITIZENSHIP

COMPETENCE

The t-test results showed that the girls got significantly higher mean scores for digital safety and resilience, while the boys scored a lot higher for digital emotional intelligence and digital creativity and innovation. No differences, meanwhile, were seen between genders for digital literacy and digital participation and agency. The results coincide with those of the multiple regression analysis, suggesting that gender does affect the students' competence in digital safety and resilience, digital emotional intelligence, and digital creativity and innovation. While the girls still seem focused on staying safe online, the boys are already moving towards advancing their digital citizenship skills.

Digital creativity and innovation are important skills for a country that develops products and services. But while the girls are still working on their personal well-being, the boys are now ready to hone their skills by exploring new possibilities in the digital world.

Educational interventions need to be designed to bridge the digital divide brought on by gender. Future research should further inquire why gender matters when it comes to certain digital citizenship competencies.

The multiple regression analysis also indicated the following:

- Students who can code are more likely to score higher for digital participation and agency than those who cannot.
- Learners who can develop web applications are more likely to score higher in digital safety and resilience and digital creativity and innovation.
- The highest educational attainment of the students' parents do not affect their digital competence.
- The more books there are in the students' homes, the higher their score for digital literacy.

If anything, the analysis revealed a need to provide high-school students training in developing web applications and the like. This research also found that living in a home that is conducive for learning is more important than what level of education the students' parents attained.

DIGITAL LITERACY

Digital literacy refers to children's ability to seek out, critically evaluate, and use digital tools and information effectively to make informed decisions. The students scored 3.21 for this domain, which has two subcompetencies—ICT and information literacy.

Table 5: Digital Literacy

Subcompetency	Mean Score	Standard Deviation
ICT literacy	3.28	0.46
Information literacy	3.08	0.53

ICT-literate students can use available hardware and software, while information-literate ones can evaluate data to make informed decisions.

DIGITAL SAFETY AND RESILIENCE

Digital safety and resilience refers to an individual's ability to protect himself or herself and others from harm in the digital space. The students should be able to evaluate and make sense of the information they gather online. Lao PDR got a mean score of 3.28 for this domain.

Table 6: Digital Safety and Resilience

Subcompetency	Mean Score	Standard Deviation
Understanding children's rights	3.28	0.52
Personal data, privacy, and reputation	3.44	0.53
Promoting and protecting health and well-being	3.07	0.56
Practicing digital resilience	3.29	0.59

The learners got the highest score for personal data, privacy, and reputation. That indicates they are aware of the need to protect their personal information even if they put understanding their rights in the back burner.

The results also imply a need for policymakers to help children realise technology's role in promoting health and well-being.

DIGITAL PARTICIPATION AND AGENCY

A person who is competent in digital participation and agency can equitably interact, engage with, and positively influence society through ICT use. This domain has three subcompetencies—interacting, sharing, and collaborating; civic engagement; and netiquette.

Table 7: Digital Participation and Agency

Subcompetency	Mean Score	Standard Deviation
Interacting, sharing, and collaborating	3.42	0.47
Civic engagement	2.60	0.69
Netiquette	3.34	0.50

Lao students showed the highest competence for interacting, sharing, and collaborating. As such, they can interact, share data and information, and collaborate with others using suitable digital technologies to achieve shared goals.

Meanwhile, they were least competent in civic engagement. They need to improve their ability and willingness to act on opportunities to positively influence local and global communities online using the appropriate digital technologies.

Lastly, the Lao students observed netiquette or are ethical and courteous when they interact and engage with others in different digital environments.

DIGITAL EMOTIONAL

INTELLIGENCE

Digital emotional intelligence is the ability to recognise, navigate through, and express emotions in digital intra- and interpersonal interactions. The students should be self-aware, can self-regulate and -motivate, have interpersonal skills, and demonstrate empathy.

Table 8: Digital Emotional Intelligence

Subcompetency	Mean Score	Standard Deviation
Self-awareness	3.09	0.52
Self-regulation	3.12	0.59
Self-motivation	3.19	0.56
Interpersonal skills	3.04	0.57
Empathy	2.82	0.67

The Lao students are self-aware and can self-regulate and -motivate. They got the highest score for self-motivation. They show initiative and are committed to attaining their internal or external goals in the digital world despite setbacks. They can also manage their emotions, moods, and impulses when online and understand their feelings and manage these through introspection.

On the other hand, the learners need to build more positive online relationships. They need to communicate and build rapport with others and demonstrate trust, embrace diversity, manage conflicts, and make sound decisions. They need to be more empathic. They should show compassion and acknowledge others' feelings, needs, and concerns.

DIGITAL CREATIVITY AND INNOVATION

Digital creativity and innovation refers to the ability to express and explore oneself through content creation using ICT tools. This domain has two competencies—creative literacy and self-expression.

Table 9: Digital Creativity and Innovation

Subcompetency	Mean Score	Standard Deviation
Creative literacy	2.66	0.61
Self-expression	2.89	0.59

The students scored the lowest for this domain. They can use technology to creatively present themselves and exercise their right to fun and relaxation. They were more competent in self-expression than creative literacy.

The respondents need support on improving their creative literacy. They should learn to apply their skills and use tools to create, adapt, or curate digital content.

DIGITAL DEVICE USAGE AND ACCESS

Smartphones were the most accessible digital device to the students at home and in the local community. They also had access to laptops at home and desktops in local community centres. Desktops are most accessible in school, followed by desktops. The survey results suggest the respondents' preference for using desktops over laptops, regardless of location.

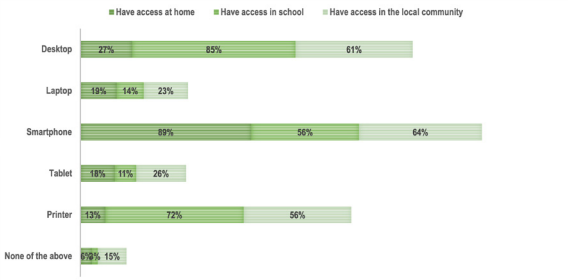

Figure 30: Tools students use to access the Internet

Some learners do not have access to any of the digital devices listed (6%), suggesting the existence of a digital divide. While schools and local community centres can somehow bridge the gap, some establishments should do more. But they may not be able to do that without the government's help.

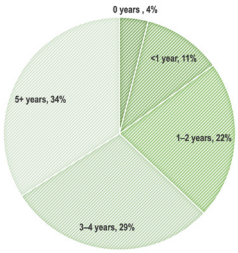

Figure 31: Total amount of time spent using digital devices

Some 4% of the students said they have never used digital devices, while 11% have been using them for less than a year. The majority of the respondents have been using digital devices for more than five years now (34%).

Further analysis revealed that the longer the students have been using digital devices, the more competent they are in terms of digital safety and resilience and digital creativity and innovation. Thus, it is important for children to get access to digital devices as early as possible to become digitally competent.

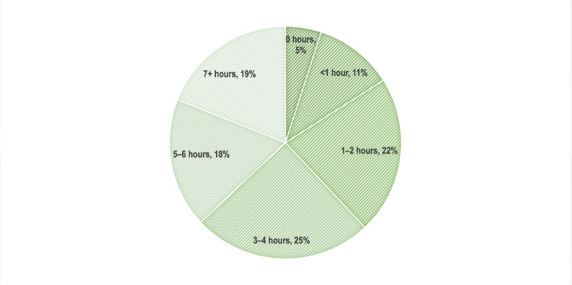

Figure 32: Time spent on accessing the Internet and using digital devices daily

A small share of the learners hardly use the Internet (5%), while 33% use devices and access the Internet for up to two hours a day. The majority did so for 3–4 hours daily.

Further analysis revealed that people who spend more time online daily are more competent in digital safety and resilience.

For 1–2 hours each day, 36% of the students access the Internet and use digital devices for schoolwork, 35% for personal purposes, 26% for leisure, and 32% for socialising. Note that a significant number of students said they hardly access the Web or use digital devices for schoolwork (19%), another indicator of a digital divide.

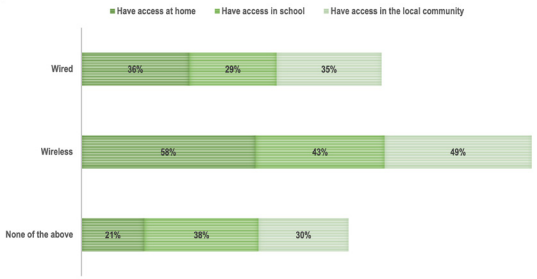

Figure 33: Internet connection type

Unsurprisingly, wireless Internet access was most used, regardless of location. However, a significant number do not have access to any type of connectivity anywhere, again indicating a digital divide.

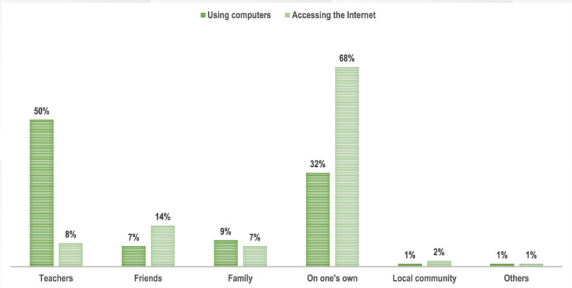

Figure 34: Who students learned about using computers and the Internet from

Some 32% of the students learned to use computers on their own, while 50% learned from their teachers. More than half learned to access the Internet by themselves (68%).

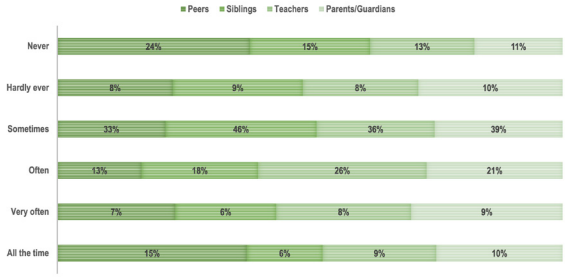

Figure 35: Frequency people tell the students to access the Internet safely

Many students said their parents or guardians guide them in using the Internet safely all the time compared with other stakeholders. But even more are guided by their teachers often, very often, or all the time.

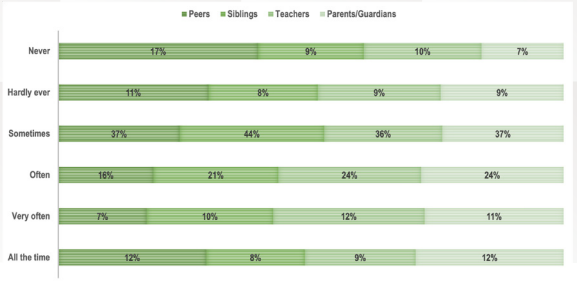

Figure 36: Frequency people encourage the students to learn things from the Internet

Many students said their parents or guardians encourage them to learn new things on the Internet all the time compared with other stakeholders. Surprisingly, a lot of them reported getting encouragement from their peers often, very often, or all the time.

INSIGHTS INTO THE DIGITAL LIVES OF CHILDREN IN THE PHILIPPINES

Research Methodology

"Insights into the Digital Lives of Children in the Philippines" is, based on the guidelines UNESCO set for the DKAP project, a quantitative study that uses an online survey as a means to collect data on Internet and ICT tool usage among 15-year-old students. Funded by UNESCO and KFIT, it was conducted by the DepEd and PNU.

This section describes the methodology the research team used, including a profile of the survey sample and the sampling, data collection, and statistical validation processes they utilised. Note that the results and findings were validated by various stakeholders, including the researchers, national research experts, the DKAP project team members, and their partners. Research limitations and challenges are presented here as well.

SURVEY PREPARATION

The DKAP questionnaire was converted into an online format using Google Form by the PNU researchers. The initial draft was presented to the NRT comprising PNU and DepEd staff for feedback until a final draft was approved.

The researchers then allotted specific amounts of time to complete the survey as shown below.

Table 10: Survey Time Allotment	
Activity	**Time**
Student preparation and reading of instructions	10 minutes
Survey completion	45 minutes
Questionnaire submission	1 minute
TOTAL	**56 minutes**

SAMPLING METHOD

To ensure an accurate representation of the Filipino learners, the NRT used a two-stage stratified random sampling approach.

In the first stratification stage, the researchers randomly selected public and private schools from both urban and rural areas. In the second stage, 15-year-old students from grade 10 were randomly chosen. Both stages used DepEd's primary management information system (MIS) Basic Education Information System (BEIS). Microsoft Excel's randomiser function was employed on BEIS to name four schools per region.

Given that the country just suffered from two very destructive typhoons, one heavily affected region was excluded from the research. Note, too, that since the National Capital Region (NCR) is entirely categorised as an urban area, the researchers could not identify rural schools from it.

At the end of the sampling process, a total of 1,186 participants from 32 schools responded to the survey. Of them, 342 are from private schools (29%), while the remaining 844 are from public schools. Also, 695 are from urban areas (59%), while the remaining 491 are from rural areas. Finally,

686 are girls (58%) and 500 are boys (42%).

DATA COLLECTION

Data collection was carried out between October and November 2020 with the help of field coordinators from DepEd.

Figure 37: Data collection process and field operation procedure

The draft survey questionnaire was piloted in a state university's laboratory school. The survey was administered among 32 grade 10 students from the said school. The respondents informed the researchers how much time they spent completing the survey. They also identified questions they had a difficult time understanding. All the information was then used to finalise the questionnaire.

The NRT then oriented the field research coordinators. They were given a background of the DKAP project. The research design, data collection strategy, and their roles were also discussed.

The field research coordinators were tasked to coordinate with the chosen schools then collect and consolidate their contact details for the survey deployment. They were told that the questionnaire would only be accessible from 8:00 A.M. to 5:00 P.M., Monday to Friday.

To ensure compliance with the Data Privacy Act of 2012 or Republic Act (RA) No. 10173, the list of the selected learners and more information on the survey were given to the school heads via email. After that, the school coordinators administered the survey after telling the participants about the research.

PNU monitored the data collection to ensure

that all the targeted respondents submit their filled-in questionnaires.

SURVEY RESULTS RELIABILITY AND VALIDITY

One of the goals of this study is to determine if the DKAP survey questionnaire is a reliable and valid instrument. For this purpose, the researchers obtained Cronbach's alpha to determine if each domain's primary competency was consistent with its subcompetencies. The values obtained for the domains ranged from 0.81 to 0.89, which indicate consistency. Those for the subcompetencies, meanwhile, ranged from 0.58 to 0.85, which are acceptable. Given these results, the DKAP survey is reliable.

To assess the validity of the DKAP survey, a CFA using SEM was performed on the data collected. CFA was performed on each domain with its subcompetencies as latent variables and their corresponding items as observed variables. Overall, the results indicate that all five domains are a good model fit even if digital literacy obtained a less-than-satisfactory fit. All domains scored great in terms of their hypothesised latent factors with standardised parameter estimates ranging from 0.38 to 0.83. Moreover, the standardised parameter estimates were all above 0.50, except for one item each under ICT literacy, understanding children's rights, promoting and protecting health and well-being, and civic engagement. Overall, the CFA results proved the validity of the DKAP survey.

DATA ANALYSIS

The responses were analysed by determining frequencies, percentage scores, mean scores, and standard deviations to ascertain the students' digital citizenship competence. When applicable, some responses were reverse-coded.

A series of independent sample t-tests were conducted to identify differences in the participants' digital citizenship competency scores due to gender, school type, and location. Afterwards, a series of multiple regression analyses were performed to see if a set of personal and contextual factors affect the students' competence in each domain. To account for shared variances, all hypothesised predictor variables were subjected to the multiple regression model simultaneously.

RESEARCH LIMITATIONS AND CHALLENGES

The researchers were ethical, especially during the data collection phase. They made sure the students' parents or guardians gave their consent. The participants were also given the freedom to choose if they would participate or not. And since the survey was conducted online, they were not exposed to COVID-19. They did not even need to give their names and were instead identified by identification numbers. Only the researchers involved in data coding and analysis had access to the students' personal data.

As with other studies, this research had limitations, including:

- Since the survey relied on the students'

self-perception, the results may be biased. Some respondents may have also misunderstood a number of questions.

- The sample size may not be representative of the entire 15-year-old population of the Philippines. As such, caution should be exercised when generalising the survey results. Also, due to the ensuing pandemic, only those with access to digital devices and the Internet participated in the study. In the future, data collection through printed questionnaires may be considered.

- While all the competencies proved consistent with their subcompetencies, it may be more useful to use the findings for the competencies instead of those for the subcompetencies to describe the children's digital citizenship competence.

- Not all of the possible personal and contextual variables were considered in the survey. Some unidentified variables could have a greater impact on the respondents' digital citizenship competence. Moreover, while the researchers used correlation techniques, the analysis may not support cause-and-effect relationships. As such, the predictive effects of the factors are indicative of correlation and not causality.

- Since the data collection ensued amidst the pandemic when most students were studying remotely, their responses could be biased towards their current learning experiences. If things were normal, the results could be different.

The researchers were also met with challenges. Since lockdowns were in force, the NRT members had a hard time setting up meetings. It did not help either that when data collection commenced, two successive typhoons affected several regions in the country, which could have affected the response turnout. That necessitated the NRT to extend the survey administration schedule.

Survey Results and Research Findings

Apart from determining if the DKAP survey measures the digital citizenship competence of Asia-Pacific students, this study also aims to measure how digitally competent Filipino students are.

In general, the results showed that the respondents are good digital citizens, as evidenced by their mean scores for four of the five domains.

Table 11: Students' Overall Mean Scores

Domain	Mean Score	Standard Deviation
Digital literacy	3.19	0.51
Digital safety and resilience	3.47	0.41
Digital participation and agency	3.18	0.45
Digital emotional intelligence	3.28	0.44

Table 11: Students' Overall Mean Scores		
Domain	**Mean Score**	**Standard Deviation**
Digital creativity and innovation	2.96	0.55

The Filipino 15-year-olds got the highest mean score for digital safety and resilience. That means they are, on average, generally aware of cyberthreats and know how to use the knowledge they get from online references. They did, however, get the lowest mean score for digital creativity and innovation, which means they need to hone their ability to express themselves better on different digital platforms. They have yet to show off their creativity and innovativeness in the virtual realm.

The results mirror those of the first DKAP survey, where the four countries also got a high mean score for digital safety and resilience and a low one for digital creativity and innovation. Nevertheless, some notable results were obtained from the Philippine survey, namely:

- The Philippine mean score for digital safety and resilience and digital literacy came only second to South Korea's.
- The Filipino students scored higher than all four countries for digital participation and agency.
- While South Korea had the highest mean scores for digital creativity and innovation and digital emotional intelligence in the first survey, the Philippines got notably higher scores for these domains.

Despite all these, though, the comparison of the results for the Philippines and the four countries from the first survey should be interpreted with caution, as a lot has changed since the COVID-19 pandemic hit.

The results suggest that the Philippine government needs to invest more in digital citizenship education programmes. Likewise, the data gathered can serve as a basis to improve the spiral progression of current ICT curriculum standards and their implementation. Today's education system should not just focus on digital or ICT literacy but also consider the other DKAP domains. The government should craft policies and programmes to enhance Filipino students' digital creativity and innovation.

GENDER, SCHOOL TYPE, AND GEOGRAPHICAL LOCATION

The survey results indicate that girls are significantly more digitally competent than boys, except in terms of digital creativity and innovation. However, when other factors are considered, a person's gender only matters when it comes to digital literacy and digital safety and resilience.

Private school students got higher mean scores in digital literacy, digital safety and resilience, and digital emotional intelligence than those from public schools. No differences were seen for the remaining two domains. Surprisingly, the multiple regression analysis results indicate that when other factors are controlled, school type is not an influencing factor, except for digital creativity and innovation.

Students from urban schools got higher mean scores for digital literacy and digital

safety and resilience compared with those from rural schools. No significant differences were seen for the other domains.

Educational policies and interventions thus need to be designed to bridge the digital divide between the advantaged and disadvantaged students.

PERSONAL AND CONTEXTUAL FACTORS ASSOCIATED WITH DIGITAL CITIZENSHIP COMPETENCE

The multiple regression analysis also implicated the following:

- Students who can code are more likely to score higher across all domains than those who cannot.
- Learners who can develop web applications are more likely to score higher across all domains, except digital safety and resilience.
- The highest educational attainment of the students' parents do not affect their digital competence, except for digital creativity and innovation. Those whose parents did not finish their studies scored high for this domain.
- Learners who had cars, TV sets, or bathrooms with a tub or shower scored higher across all domains, except digital participation and agency.
- The number of books in the students' homes had nothing to do with their digital competence.

If anything, the analysis revealed the need to provide high-school students with training in developing web applications and the like. This research also found that living in a home that is conducive for learning is more important than what level of education their parents attained.

DIGITAL LITERACY

Digital literacy has two competencies—ICT and information literacy. ICT-literate students can use available hardware and software, while information-literate ones can evaluate data to make informed decisions.

Table 12: Digital Literacy

Subcompetency	Mean Score	Standard Deviation
ICT literacy	3.21	0.52
Information literacy	3.15	0.58

The learners scored higher for ICT literacy than information literacy. They got an ICT literacy mean score that was lower than those of South Korea and Fiji but higher than those of Vietnam and Bangladesh. Their information literacy score is also lower than South Korea's but higher than all the other countries.

On average, the students are ICT- and information-literate, which could be indicative of the effectiveness of DepEd's digital literacy programmes.

DIGITAL SAFETY AND RESILIENCE

Digital safety and resilience refers to an individual's ability to protect himself or herself and others from harm in the digital space. The students should be able to evaluate the information they gather online to make informed decisions.

Table 13: Digital Safety and Resilience

Subcompetency	Mean Score	Standard Deviation
Understanding children's rights	3.56	0.45
Personal data, privacy, and reputation	3.56	0.50
Promoting and protecting health and well-being	3.27	0.55
Practicing digital resilience	3.44	0.56

The respondents are most confident in understanding children's rights, even if they scored lower than the four countries from the first survey. They also got the same score for personal data, privacy, and reputation, higher than all the first survey's respondents. Their score for digital safety and resilience is also well above the midpoint and thus higher than the four countries'.

On average, the respondents are knowledgeable in digital safety and resilience but may need to improve their understanding of children's rights to keep pace with other Asia-Pacific countries. That is especially critical given the increasing number of cases of cyberbullying and other online misbehaviours on social media.

DIGITAL PARTICIPATION AND AGENCY

Digital participation and agency is the ability to equitably interact and engage with and positively influence the society through ICT use.

Table 14: Digital Participation and Agency

Subcompetency	Mean Score	Standard Deviation
Interaction, sharing, and collaboration	3.36	0.55
Civic engagement	2.73	0.67
Netiquette	3.45	0.53

Among the three subcompetencies, the students scored highest in netiquette, which suggests they are courteous and behave appropriately online. They got a low score, however, for civic engagement. While their score is well below the midpoint, they actually got a higher score than the four countries from the first survey. They need more training in school, though, and should be given opportunities to volunteer and influence others online.

DIGITAL EMOTIONAL INTELLIGENCE

The prolific use of technology today has been dissuading children from real-world

activities that can affect their emotional intelligence. That makes digital emotional intelligence an important area of study so they can recognise, navigate through, and express their emotions even in their digital intra- and interpersonal interactions.

Table 15: Digital Emotional Intelligence

Subcompetency	Mean Score	Standard Deviation
Self-awareness	3.39	0.50
Self-regulation	3.30	0.54
Self-motivation	3.31	0.55
Interpersonal skills	3.18	0.57
Empathy	3.17	0.58

The results indicate that Filipino students possess adequate digital emotional intelligence. They are particularly self-aware. Their score, in fact, is higher than those of the countries from the first survey. The same was true for interpersonal skills. And while they scored low for empathy, they actually did better than the other countries, except South Korea.

Interestingly, while the 15-year-olds are conscious of their activities, self-regulate, and are intrinsically motivated, they need to work on understanding and relating well with others. Socialising and networking are critical in the digital realm and so the students may need more interpersonal skills training.

DIGITAL CREATIVITY AND INNOVATION

Digital creativity and innovation refers to an individual's ability to express and explore his or her interests through content creation using ICT tools. As UNESCO said, this domain is the most challenging to address since all the countries in the first survey got the lowest mean scores for it.

Table 16: Digital Creativity and Innovation

Subcompetency	Mean Score	Standard Deviation
Creative literacy	2.96	0.63
Self-expression	2.96	0.63

The students got identical mean scores for creative literacy and self-expression, suggesting they are not as digitally creative and innovative as they could be even if they scored higher than the respondents of the first survey.

Like other Asia-Pacific children, they need to be more confident in using digital tools to create content and express themselves. Just as creativity is a critical 21st-century skill, it is also a must in the digital world.

DIGITAL DEVICE ACCESS AND USAGE

Smartphones proved most accessible to the Filipino students, which is the case at home, in school, and in local community centres. This result is consistent with the trend observed in countries where smartphones are the most used devices. The second-most accessible device at home is a laptop

and in school is a desktop.

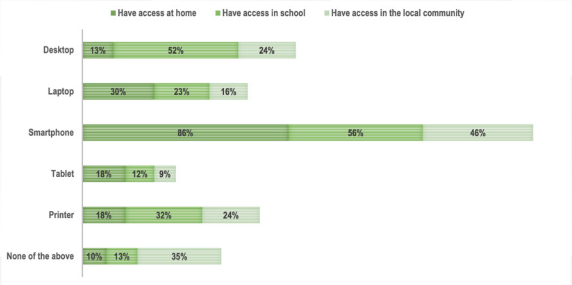

Figure 38: Tools students use to access the Internet

Some of the students said they do not own any of the digital devices listed (10%), which suggests a digital divide. While schools and local community centres can help bridge the gap in digital device access at home, more can be done.

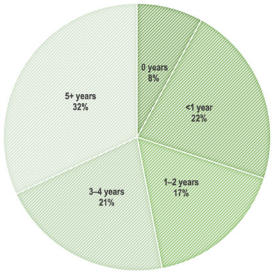

Figure 39: Total amount of time spent using digital devices

Some 8% of the students said they never use any digital device, while 22% have been using such for less than a year. That means around 30% of the respondents never used digital devices until they reached the age of 14. Further analysis revealed that digital device use is an influencing factor for all domains, except digital creativity and innovation. More experience in using digital devices means better digital literacy, digital safety and resilience, digital participation and agency, and digital emotional intelligence.

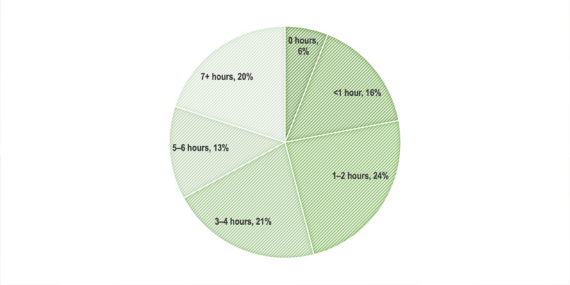

Figure 40: Time spent on accessing the Internet and using digital devices daily

Only 6% of the students said they hardly ever access the Internet, while 40% said they did so 1–2 hours a day. More, however, reported they access the Web at least three hours each day. Further analysis revealed that the more frequently the students went online, the more digitally competent they got.

The learners said they access the Internet and use digital devices for 1–2 hours for schoolwork (32%), personal purposes (37%), leisure (31%), and socialising with friends (33%). Surprisingly, a significant number said they hardly ever access the Web or use digital devices for schoolwork (15%), which could be another indicator of the existing digital divide.

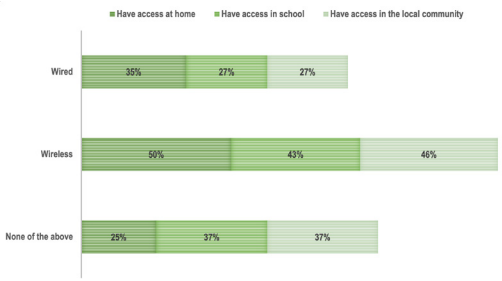

Figure 41: Internet connection type

Wireless Internet access is more common at home, in school, and in local community centres. However, a significant percentage of students also reported lack of access to the Internet, regardless of location.

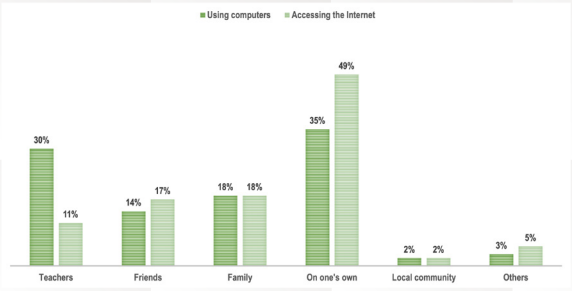

Figure 42: Who students learned about using computers and the Internet from

When asked who taught them how to use a computer, 34% of the students said they learned on their own, while 30% learned from their teachers. The trend differed a bit for accessing the Internet, as 49% said they learned by themselves, but more learned from family or friends than their teachers.

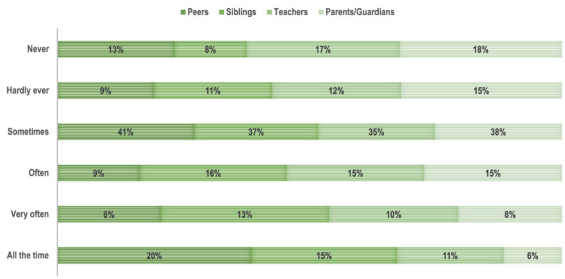

Figure 43: Frequency people tell the students to access the Internet safely

More students said their parents or guardians guide them in accessing the Internet safely all the time compared with other people. The results also showed that more respondents are guided by their teachers often, very often, or all the time.

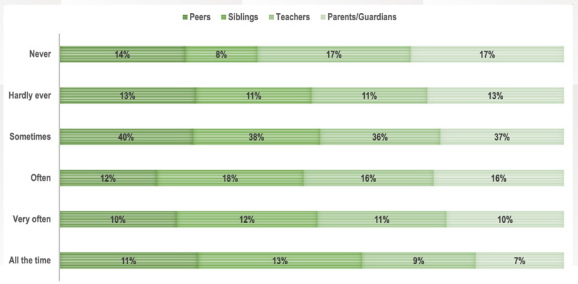

Figure 44: Frequency people encourage the students to learn things from the Internet

More students said their teachers encourage them to learn new things from the Web all the time compared with other people. The results also showed that more respondents reported getting encouragement from their teachers often, very often, or all the time.

SUMMARY OF REGIONAL RESULTS

Regional Survey Results and Findings

Based on the survey results, we were able to obtain the following generalisations about the digital citizenship competence of children in Indonesia, Lao PDR, and the Philippines:

- The students in the three countries are digitally literate with an overall mean score of 3.18. That means they can seek out, critically evaluate, and use digital tools and information effectively to make informed decisions. They can also successfully manage hardware and software and use ideas and information to make the right decisions.

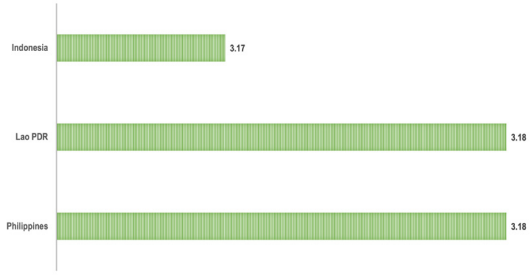

Figure 45: Students' mean score for digital literacy

- The Indonesian, Lao, and Filipino learners are very adept at digital safety and resilience, as evidenced by an overall mean score of 3.32. They can protect themselves from any kind of harm online. Specifically, they know their legal rights, are conscious when sharing information online, respect others' privacy, maintain a healthy well-being, and are proactive when dealing with different challenges.

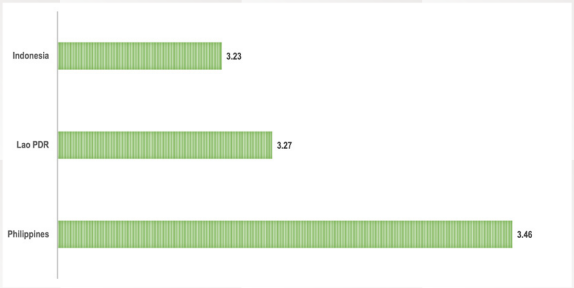

Figure 46: Students' mean score for digital safety and resilience

- The participants proved competent in digital participation and agency with an overall mean score of 3.14. They can use ICT tools to engage in positive interactions. They also collaborate well with others online to achieve a common goal, even those related to civic activities. They are also ethical and courteous.

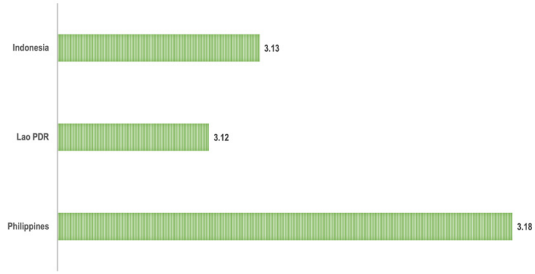

Figure 47: Students' mean score for digital participation and agency

- The Indonesian, Lao, and Filipino 15-year-olds demonstrate emotional intelligence online, as evidenced by an overall mean score of 3.13. They want to eliminate the digital divide. They also promote equity and inclusivity. They are aware of the physiological changes their bodies are undergoing, understand the complexities of their behaviours and emotions, and recognise the factors that can help them achieve their goals. They also understand themselves and others.

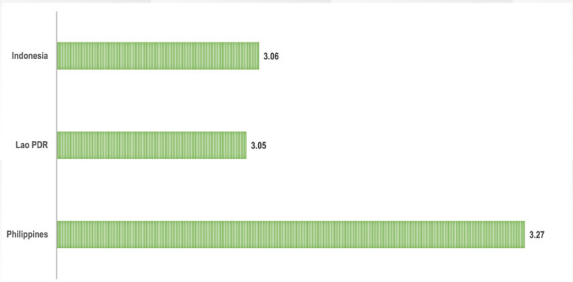

Figure 48: Students' mean score for digital emotional intelligence

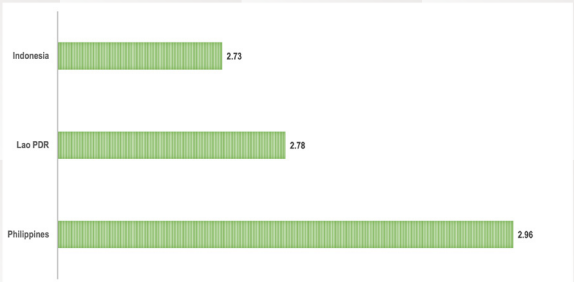

Figure 49: Students' mean score for digital creativity and innovation

- The survey respondents can improve in terms of digital creativity and innovation with an overall mean score of 2.82. They need to take advantage of the advances made in technology in creative and responsible ways. They also need to learn to craft digital content that is relevant and useful to others.

As the survey showed, the 6,074 15-year-old students from all three countries are quite adept at four of the five digital citizenship domains—digital literacy, digital safety and resilience, digital participation and agency, and digital emotional intelligence. But they do need further training and improvement in digital creativity and innovation.

CONCLUSIONS AND RECOMMENDATIONS

Conclusions

This study hoped to identify policy recommendations so national governments can enhance children's digital citizenship competence. An analysis of the survey results and research findings led to the following conclusions:

- While students in Indonesia, Lao PDR, and the Philippines are competent in using ICT tools and the Internet, they need to become more creative and innovative and create content for other people's consumption.
- The 15-year-olds use smartphones most to access the Internet for school and other activities.
- Teachers can do more to improve children's digital competence to get them ready for life in the 21st century and the challenges of Industry 4.0. That would, however, require digital citizenship education for teachers in training as well.
- Digital citizenship education should be made part of basic education curricula. If the world is to survive in the new normal, all schools must be ready to shift to remote or flexible learning at any time. To date, much work still needs to be done to turn learners into competent and responsible digital citizens.
- The survey results can serve as a benchmark for future assessments to identify potential changes that can be made to existing programmes and policies so they can better serve the respondents. That includes modifying the DKAP questionnaire over time.
- National governments should work harder to address the digital divide. As this study showed, better access to digital devices and the Internet translates to more digitally competent citizens. The role that schools and local community cetres play in bridging the gap cannot be overemphasised as well.

Recommendations

The researchers from the three countries surveyed offer these recommendations:

- The students need training to improve their creativity and innovation online. The Internet and ICT tools are not going away and will only become more advanced over time. We will only become more reliant on social media as well. But they come with their own set of challenges. The Worldwide Web can give out a lot of misleading information or undesirable content that can lead the youth astray. Children can be taught to gain entrepreneurship skills, too, which is a form of getting creative. Educators can leverage some youngsters' aspiration to become the next big YouTube star to encourage them to be more creative and innovative online.
- National governments can spearhead the development of existing information technology (IT) networks so they can serve people better. It is, after all, clear that if remote learning and work setups continue on post-pandemic, then the countries need a reliable infrastructure.

- Teachers and parents need to help mentor children on the benefits and challenges of going online. They should ensure that the Internet and ICT tools are not misused, though. Advanced technologies should not serve as means to commit plagiarism, for instance. Parents, for their part, should not use gadgets as substitute caregivers for their children. Monitoring their activities, installing cybersecurity solutions into their gadgets, and giving them advice on staying safe online are also good ideas.

- Ministries of education need to develop a holistic framework for digital citizenship education in their countries. They can use the DKAP framework and the survey results to identify gaps to address. They need to go beyond developing children's digital literacy and teach them to become digital natives who are socially responsible and individually capable.

- Researchers are encouraged to conduct further studies on the digital citizenship competence of today's learners. These can focus on exploring other personal and contextual factors beyond those featured in this study. Another can focus on designing intervention programmes for national or regional implementation.

In sum, the DKAP framework and survey questionnaire are important developments that give Asia-Pacific countries an opportunity to assess their students' digital citizenship competence. While much work needs to be done to accurately measure children's digital citizenship competence, this study provides important information that can serve as preliminary data for future research.

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