Girls' Digital Literacy in the East Asia and Pacific Region

Spotlight on Cambodia, Indonesia, Lao PDR, Timor-Leste and Viet Nam

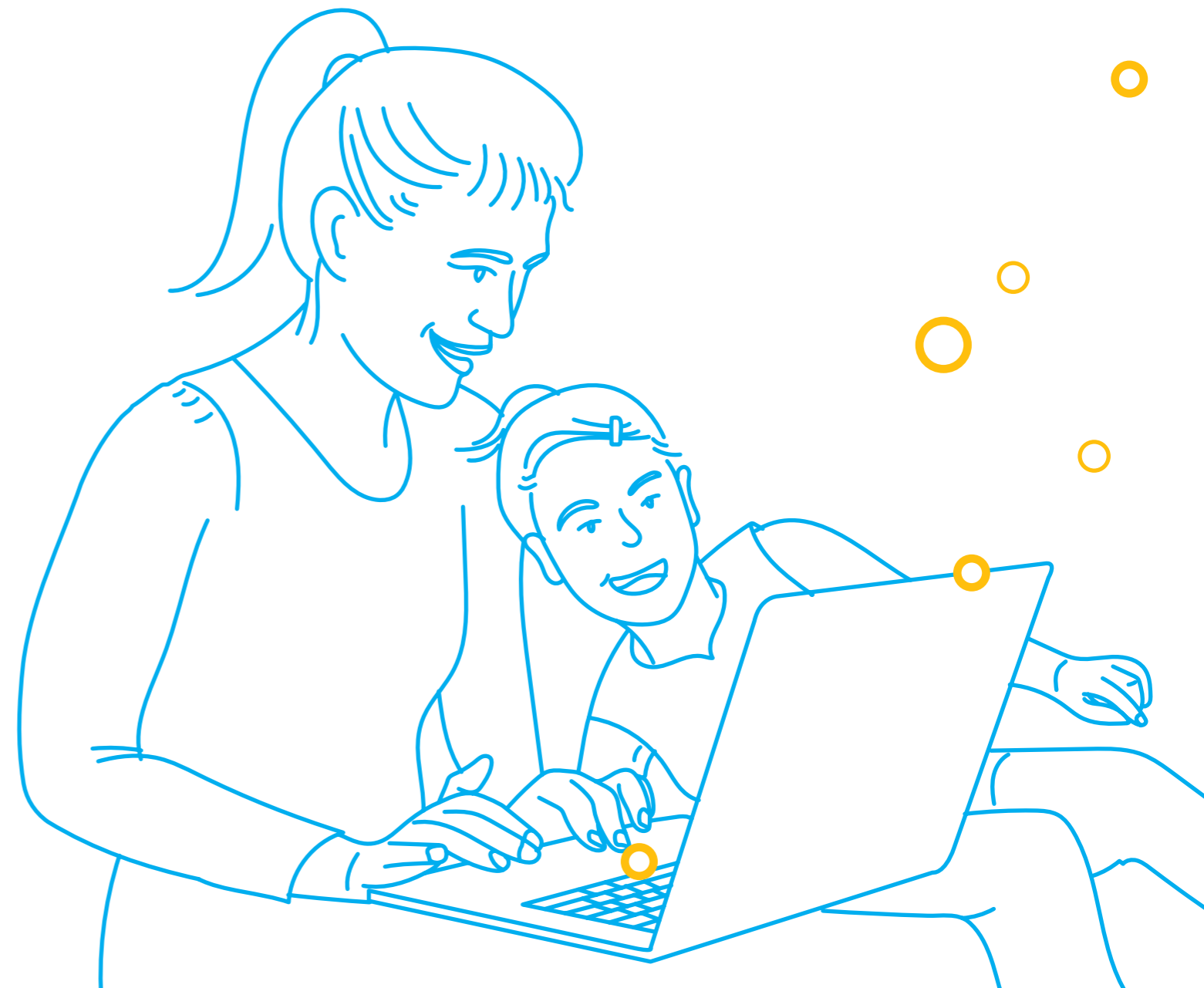# Girls' Digital Literacy in the East Asia and Pacific Region

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Contents

List of figures

List of tables

List of boxes

Acronyms and abbreviations

AEAI	Aide et Action International
ASEAN	Association of Southeast Asian Nations
AVR	augmented virtual reality
COVID-19	Coronavirus disease
CFC	Vietnam Center for Consultancy on Family Health and Community Development (Viet Nam)
DHS	Demographic and Health Surveys
DMA	digital maturity assessment
GSMA	Global System for Mobile Communications Association
ICILS	International Computer and Information Literacy Study
ICT	information and communication technology
IT	information technology
ITU	International Telecommunication Union
LGBTQIA+	lesbian, gay, bisexual, transgender, queer or questioning, intersex, asexual or ally, and other gender and sexual identities
MIC	Ministry of Information and Communication (Indonesia)
MICS	Multiple Indicator Cluster Surveys
MIT	Ministry of Innovation and Technology (Cambodia)
MoECRT	Ministry of Education, Culture, Research and Technology (Indonesia)
MoES	Ministry of Education and Sports (Lao PDR)
MoEYS (Cambodia)	Ministry of Education, Youth and Sport (Cambodia)
MoEYS (Timor-Leste)	Ministry of Education, Youth and Sport (Timor-Leste)
MT	Ministry of Telecommunications (Cambodia)
NEET	not in education, employment or training
NGO	non-governmental organization
NGS	New Generation School
OECD	Organisation for Economic Co-operation and Development
Lao PDR	Lao People's Democratic Republic
PISA	Programme for International Student Assessment
SEAMEO CED	Southeast Asian Ministers of Education Organization, Regional Centre for Community Education Development

STEM	science, technology, engineering and mathematics
UNESCAP	United Nations Economic and Social Commission for Asia and the Pacific
UNDP	United Nations Development Programme
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNICEF	United Nations Children's Fund
UNICEF EAPRO	United Nations Children's Fund, East Asia and Pacific Regional Office
USAID	The United States Agency for International Development
Vietnet-ICT	Vietnet Information and Communication Technology Center (Viet Nam)

Executive summary

The ability to use digital technology safely and effectively is increasingly important to participation in today's world. Yet globally, girls and women are accessing and using digital technology in smaller numbers than boys and men. For example, a global study by Girl Effect and the Vodafone Foundation found boys were 1.5 times more likely than girls to own a mobile phone and 1.8 times more likely to own a smartphone. Furthermore, roughly 46 per cent of boys used the internet on their phones, compared with 27 per cent of girls.[1] Importantly, lack of knowledge about how to use technology is frequently cited as a key barrier to digital access.[2] However, significant data gaps exist globally, and in East Asia and the Pacific specifically, about the digital literacy of girls and boys.[3]

The following report therefore aims to provide an initial snapshot of the situation for adolescent girls across the region. It explores girls' digital access, use and competences; how girls develop digital literacy; and how their needs are currently addressed through digital literacy education. The study involved a desk review pertaining to the wider region, and primary research in five focus countries (Cambodia, Indonesia, Lao PDR, Timor-Leste and Viet Nam). The primary research included key informant interviews, UNICEF country office consultations, and a self-administered online survey with teachers.

The study identified the following key findings:

Digital access, use and competences

- Mobile phones provide the main source of digital access for girls and boys, who are accessing these devices primarily in the home environment.

- Adolescents often engage in only a few basic digital activities, focused primarily on entertainment (e.g., playing games and watching videos) and communication (e.g., chatting on social media), and some also use digital technology to search for information.

- Despite feeling that digital literacy is important for their future, adolescents often only possess basic digital competences (e.g., simple search and content consumption).

- Lack of progression to more advanced digital competences seems to be particularly acute among girls.

Learning modalities, enablers and barriers

- Adolescent girls and boys tend to develop their digital literacy through a combination of self-learning and social learning. The latter often occurs with friends and family and is largely centred around mobile devices.

- Lack of access to infrastructure, devices and data can pose a barrier to adolescents across the region, particularly in rural areas.

- Language issues can also be a challenge, particularly for those unfamiliar with English, as much of the relevant content is produced in this language.

- Sociocultural norms can present a barrier specifically to girls. Stereotypical gender roles can affect girls' confidence, motivation and interest in developing more advanced digital competences, and concerns about girls' online safety can lead gatekeepers (e.g., parents and caregivers) to impose restrictions on use, thus impeding girls' opportunities to learn.

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1   Girl Effect & Vodafone Foundation. (2018). Real girls, real lives, connected.
2   See for example: GSM Association (GSMA). (2022). The mobile gender gap report; UNESCO. (2019); Girl Effect & Vodafone Foundation. (2018). Real girls, real lives, connected.
3   UNICEF Gender and Innovation. (n.d.). What we know about the gender digital divide for girls: A literature review.

Pedagogies, policies and curricula

- Governments across the region are engaging in large-scale digital transformation efforts, and digital literacy education is often considered an integral aspect of this.
- However, governments have a number of challenges to contend with in order to introduce digital literacy education, including lack of digital access and poor teaching quality in the public school system.
- Gender is not a consideration for most educators when teaching digital literacy. Current approaches to teaching digital literacy therefore appear to be largely gender-blind.
- This gender-blind teaching could act as a further barrier to girls' digital literacy development, given the sociocultural norms that need to be addressed to support girls' progression to more advanced digital competences.

The report concludes by summarizing the findings, outlining key issues to address, and providing recommendations on how to support girls across the region to develop their digital literacy. Recommendations focus on building an evidence base to address data gaps on girls' digital literacy; increasing access to affordable internet and digital devices, particularly in rural areas; developing instructional materials and digital content in local languages; and addressing sociocultural norms that limit girls' technology-related aspirations and learning opportunities.

DIGITAL LITERACY is critical to participation in today's world. As societies around the globe become increasingly digitized, the ability to use technology is becoming ever more important for engagement in everyday life and work activities. For example, by the year 2030, up to 80 per cent of jobs in Southeast Asia will require basic digital literacy and applied information and communication technology (ICT) skills, and this requirement is expected to particularly affect industries where women predominate in the workforce.[4] It is therefore vital that young people learn to harness technology, both to make the most of the opportunities and to manage the risks associated with being online.

Data from the International Telecommunication Union (ITU) show that youth across the Asia-Pacific region are using digital technology in large numbers. In 2022, an estimated 73 per cent of Asia-Pacific youth aged 15–24 years used the internet. This is higher than the rate among youth in Africa (55 per cent), but it remains lower than the rate among youth in the Arab States (80 per cent), Americas (94 per cent) and Europe (98 per cent).[5]

When focusing on East Asia and the Pacific, it is important to acknowledge the vast size and diversity of the region. Approximately one third of the world's population and more than one quarter of the world's children – around 580 million children in total – live in the region.[6] It is also hugely diverse in terms of social, cultural, economic and technological contexts.[7] For example, the ICT Development Index (2017) indicates that the Asia-Pacific region had the widest range of scores compared with other regions, with results ranging from 1.95 to 8.85 (10 being the highest possible rating).[8] High-level regional data therefore mask widespread variation at the sub-regional level, and the digital inequalities that can exist within and between countries.[9]

Globally, evidence shows that girls and women have lower levels of digital literacy than boys and men, and in some cases this gap is growing.[10] For example, cross-national skills assessments reveal that women in a number of countries are 25 per cent less likely than men to know how to use technology for basic activities, such as creating simple formulas in a spreadsheet.[11] Girls and women are also less likely to know how to engage in activities such as operating a smartphone, using the internet and social media, and understanding how to safeguard personal information.[12] The gap is particularly wide among those who are less educated, have lower incomes, and live in developing countries or rural areas.[13]

4   Sasakawa Peace Foundation & Dalberg Global Development Advisors. (2017). Advancing women's empowerment: ICT skills for girls and women in Southeast Asia.

5   ITU. (2022). Measuring digital development: Facts and figures 2022.

6   UNICEF East Asia and Pacific. (n.d.). Education: Every child has the right to go to school and learn.

7   UNICEF. (2017). State of the world's children 2017: Children in a digital world; UNESCO. (2019). Digital kids Asia-Pacific: Insights into children's digital citizenship.

8   ITU. (2017). Measuring the information society report 2017: Volume 1.

9   UNESCO. (2019). Digital kids Asia-Pacific: Insights into children's digital citizenship.

10 EQUALS & UNESCO. (2019). I'd blush if I could: Closing gender divides in digital skills through education.

11 UNESCO. (2017). Accountability in education: Meeting our commitments (Global Education Monitoring Report 2017/8).

12 GSM Association (GSMA). (2022). The mobile gender gap report; EQUALS & UNESCO. (2019). I'd blush if I could: Closing gender divides in digital skills through education; Tyers, A., & Banyan Global. (2020). Gender digital divide desk review report; UNICEF Gender and Innovation. (n.d.). What we know about the gender digital divide for girls: A literature review.

13 OECD. (2018). Bridging the digital gender divide: Include, upskill, innovate; EQUALS & UNESCO. (2019). I'd blush if I could: Closing gender divides in digital skills through education; UNICEF Gender and Innovation. (n.d.). What we know about the gender digital divide for girls: A literature review.

In the wake of the COVID-19 pandemic, governments across the region have been galvanized to address digital inequalities and improve the digital literacy of local populations, through provision of equitable and inclusive education for all. This trend is illustrated by ASEAN's adoption in 2022 of the Declaration on the Digital Transformation of Education Systems in ASEAN. The Declaration commits member states to a range of actions aimed at driving digital transformation in education, which must "center the most marginalised" and involve "development of a safe, inclusive and equitable digital eco-system for the peoples of ASEAN".[14] Thus the region has an opportunity to narrow digital gender gaps and ensure girls' needs are addressed in this drive to improve digital literacy.

To ensure girls' needs are addressed, it is important to develop a comprehensive understanding of girls' digital literacy across the region. Significant data gaps exist globally, and in East Asia and the Pacific specifically, about the digital literacy of girls and boys.[15] Moreover, the data that do exist are often difficult to compare, owing to differences in how digital literacy has been defined and assessed in each study.

This report therefore aims to provide an initial snapshot of the situation for girls across the region. It explores girls' digital access, use and competences; how girls develop digital literacy; and how their needs are currently addressed through digital literacy education. The report focuses on adolescent girls aged 11–18 years; however, studies that include data on younger children and those who are slightly older have also been included where relevant. Examples of best-practice approaches to supporting girls' digital literacy development have also been highlighted where possible.[16]

The report is organized into three chapters that align with the objectives of the study:

Chapter 1 describes girls' digital access, use and competences, providing evidence that girls and boys often do not progress significantly beyond basic use or digital competences.

Chapter 2 outlines how girls and boys develop digital literacy, and the factors that act as enablers or barriers. This chapter describes how access issues can present a significant barrier, particularly for girls and boys in rural areas. Language can also pose a challenge, especially for adolescents less familiar with English. Sociocultural norms can act as a further barrier, specifically for girls, limiting their opportunities to learn or develop their digital literacy.

Chapter 3 examines digital literacy education efforts, including pedagogy, policy and curricula considerations. This chapter highlights that countries across the region recognize the importance of digital literacy education, but challenges around digital access and teaching quality can limit the opportunities to incorporate it effectively. Moreover, consideration of gender currently remains limited, although there are opportunities to address girls' specific needs and challenges in the process of ensuring equitable and inclusive education for all.

The report concludes by providing recommendations on how to address the challenges raised and to support girls across the region to develop their digital literacy.

14 ASEAN. (2022). Declaration on the digital transformation of education systems in ASEAN.

15 UNICEF Gender and Innovation. (n.d.). What we know about the gender digital divide for girls: A literature review.

16 Age terms used in this report cover the following ranges: adolescent 10–19 years, young people 10–24 years, and youth 15–24 years.

Box 1: Defining 'digital literacy'

A wide range of definitions for 'digital literacy' exist, and the term is often used interchangeably with others such as 'digital competence' and 'digital skills'.[17] This study uses the UNESCO (2018) definition:

> Digital literacy is the ability to access, manage, understand, integrate, communicate, evaluate and create information safely and appropriately through digital devices and networked technologies for participation in economic and social life. It includes competences that are variously referred to as computer literacy, ICT literacy, information literacy, and media literacy.[18]

Digital literacy encompasses knowledge, skills and attitudes.[19] 'Knowledge' refers to facts, principles, theories and practices, and is often signposted with wording such as 'is aware of' and 'understands that.' 'Skills' are the ability to apply knowledge to complete tasks, and they are signposted with wording such as 'knows how to do' and 'is able to'. 'Attitudes' refer to the motivators of performance, and include values and aspirations. They are signposted with wording such as 'is interested in' and 'feels that'.

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[17] For further discussion on this and specifically in relation to women, see: Tyers, A., Highet, C., Chamberlain, S., & Khanna, A. (2021). Increasing women's digital literacy in India: What works.

[18] UNESCO Institute for Statistics. (2018). A global framework of reference on digital literacy skills for indicator 4.4.2.

[19] Vuorikari, R., Kluzer, S., & Punie, Y. (2022). DigComp 2.2: The digital competence framework for citizens.

○ Methodology

This study used a three-pronged research approach: desk research; key informant interviews and UNICEF country office consultations; and a self-administered online survey with teachers.

The first phase involved a desk review of data, studies, literature and online articles pertaining to girls' digital literacy across the region. This comprised approximately 70 sources in total.[20] Purposive sampling was used to identify sources, with UNICEF sharing several documents for review and the authors selecting additional sources as relevant through online searches. These searches were conducted at the regional level using key search terms including 'girls', 'digital', 'literacy', 'skills', 'competence', 'education', 'policy', 'East Asia' and 'Pacific', and at the national level by including the name of the country. Most desk review findings came from analysis of existing literature and studies, with only one secondary data source identified as relevant and accessible to the authors.[21]

Five 'focus countries' were the subject of the second and third phases. These countries were Cambodia, Indonesia, Lao PDR, Timor-Leste and Viet Nam, which were selected through a purposive sampling approach. UNICEF EAPRO approached UNICEF country offices that were engaging in initiatives potentially relevant to the study, and those that expressed interest in participating were then included in the study.

The second phase involved six consultation sessions with UNICEF country offices and 15 semi-structured key informant interviews with individuals who had expertise relevant to girls' digital literacy in these countries. A purposive sampling approach was used to select key informants from a range of non-governmental organizations (NGOs), multilateral organizations and government departments. The interviews focused on understanding perceived enablers and barriers; current and future approaches to addressing barriers; and techniques that were deemed particularly effective in supporting girls' digital skills development. Thematic analysis was employed to understand the patterns that emerged across interviews.

Finally, an online survey with teachers was conducted in Cambodia, Timor-Leste and Viet Nam. A convenience sampling approach was used, and the survey was disseminated by UNICEF country offices through their local networks. The survey tool was created using the online platforms Kobo Toolbox and Google Forms, which were chosen based on local recommendations in each country.[22] The survey contained 21 questions, which explored how digital literacy was taught in schools and how teachers viewed girls' digital literacy development. The questions were also translated into one national language per country.[23] Survey uptake varied, leading to differing sample sizes between Cambodia (745 responses), Timor-Leste (95 responses) and Viet Nam (57 responses). Descriptive statistics were used to analyse survey data, which were then synthesized with the primary qualitative data and secondary research, to develop this report.

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[20] 52 sources are included in the 'References' section and the remaining 18 can be found in 'Appendix I: Additional desk review sources'.

[21] This was the dataset from UNICEF. (2020 Digital literacy in education systems across ASEAN: Key insights and opinions of young people.

[22] https://www.kobotoolbox.org/; https://www.google.co.uk/forms/about/

[23] Khmer, Cambodia; Tetun, Timor-Leste; Vietnamese, Viet Nam.

Limitations of the study

This report aims to provide a comprehensive snapshot of the situation for girls across East Asia and the Pacific, but it has a number of methodological limitations and cannot claim to be an exhaustive study of the region.

Regarding the desk research, the authors do not claim to have conducted an exhaustive review of all data, studies, documents and reports pertaining to girls' digital literacy across the region. Only English-language documents were reviewed, and local curricula and policy documents were not examined first-hand. Additional, targeted research is recommended to cover these areas especially.

The desk review identified significant gaps in the data on the digital literacy of children aged 11–18 years, and even bigger gaps for children under 11 years old. Data gaps were particularly prevalent for population groups that are typically more marginalized, including adolescents who are out of school, and those who have disabilities. These gaps mean the study is skewed towards understanding the situation for adolescents in education, and thus out-of-school, more marginalized populations remain far less visible. The lack of data also means there was limited scope to make comparisons between age groups, genders, population groups or countries.

The existing studies were most often not directly comparable. The authors of the studies frequently used different definitions of digital literacy, competences and skills; used different research techniques; and targeted different sample populations. This has led in some cases to conflicting findings, for example about whether girls' digital literacy levels are different from boys'. Additional large-scale, primary research with girls and boys is therefore recommended, and should include marginalized populations, to provide a more comparable and representative dataset for the region.

Regarding the focus countries included in phases two and three of the study, these cannot be considered representative of the wider region, as they were selected via purposive sampling and based on UNICEF in-country programmes and interest in participation.

Additionally, the key informant interviews cannot be considered representative of the focus countries, as purposive sampling was used to recruit participants, and the overall sample size was small.

The online teacher survey methodology also has several limitations. Given the convenience sampling approach used, and the small sample size in Viet Nam and Timor-Leste, the survey results cannot be viewed as representative. For example, 41 of the 57 responses in Viet Nam came from one province (Kon Tum). The scope of insight or comparison that can be made based on this data is therefore limited. Additionally, online survey methodologies rely on self-reported use, which may be influenced by social desirability bias. Further research with teachers is therefore recommended, and should include performance tests and classroom observations, to address the limitations of self-reporting.

Finally, owing to funding and logistic limitations, it was not possible to include girls themselves in the study. Consequently, this report does not claim to represent girls' own voices or perspectives. Instead, it relies on a combination of primary data from those who work with girls and secondary evidence about girls from other studies. The authors recommend that follow-up research is conducted with girls across the region, to gather their perspectives and assess their digital literacy directly.

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The current situation: Girls' digital access, use and competences

This chapter first describes girls' digital access, highlighting that mobile phones provide the main source of digital access for girls and boys, and they are accessing these devices primarily at home. It goes on to outline how adolescents tend to engage in only a few basic digital activities, focused primarily on entertainment (e.g., watching videos) and communication (e.g., chatting on social media). Later sections explore how, despite feeling that digital literacy is important for their future, adolescents often only possess basic digital competences (e.g., simple search and content consumption). It further describes how a gender gap appears to develop as adolescents proceed through education, with girls potentially less likely to progress towards developing more advanced digital competences. The chapter ends by outlining how adolescents often have some online safety competence, but girls might be less likely to develop more advanced online safety skills. Additionally, girls from more marginalized populations may have less online safety competence overall.

⭕ Setting the scene: Access to and use of digital platforms and devices

Girls' digital access

Mobile phones are by far the most accessible digital device for girls and boys. They act as the main gateway to the internet for young people and are primarily being accessed at home. For example, a study with adolescents in Indonesia, Malaysia, the Philippines and Thailand found that 90 per cent had access to smartphones at home for classes and leisure activities. However, the data revealed that average household access to laptop and desktop computers across the four countries was only 36 per cent and 20 per cent respectively (see Figure 1).[24] This trend is reflected in research with youth across the region.[25]

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24 UNICEF. (2021). Adolescent engagement and skills acquisition in digital spaces: Understanding opportunities, empowerment, and inclusion online.

25 For example, see: Girl Effect & Vodafone Foundation. (2018). Real girls, real lives, connected; Livingstone, S., Kardefelt-Winther, D., & Saeed, M. (2019). Global kids online comparative report (Innocenti Research Report); SEAMEO. (2021). Digital kids Asia-Pacific: Insights into the digital lives of children – National report Lao PDR; UNDP. (2020). Digital literacy for employability and entrepreneurship among Cambodian youth: Assessment report; UNESCO. (2019). Digital kids Asia-Pacific: Insights into children's digital citizenship.

Figure 1. **Device access at home, by device type (Indonesia, Malaysia, the Philippines, Thailand)**
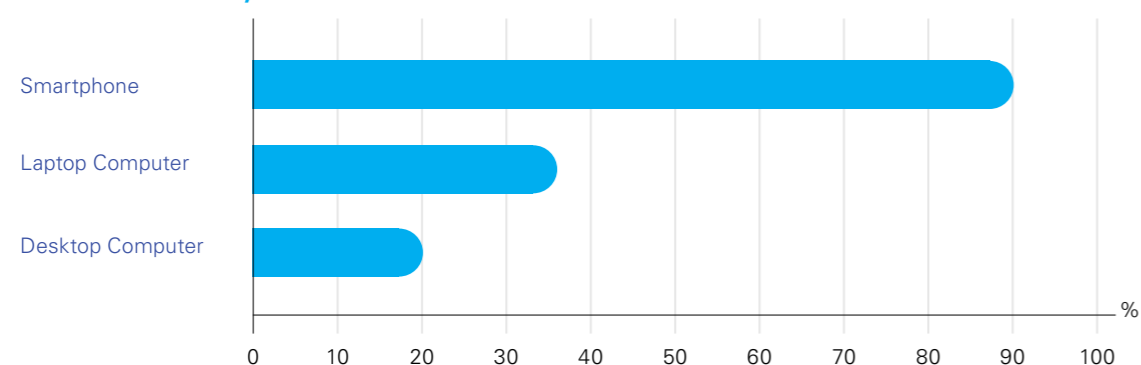
Source: UNICEF. (2021). *Adolescent engagement and skills acquisition in digital spaces: Understanding opportunities, empowerment, and inclusion online.*

Schools do not seem to be bridging the gap in access; in fact they appear to be lagging behind. For example, research with 15-year-old students found that in Viet Nam 14.6 per cent of students had no digital access at school, compared with only 0.8 per cent at home.[26] In Fiji this increased to 18.2 per cent with no digital access at school, compared with 7.1 per cent at home. Even in the Republic of Korea, 7.8 per cent of students had no digital access at school, compared with just 1.2 per cent at home (see Table 1). There was an important difference, though: when students had in-school digital access, it was more often to desktop computers than to mobile phones. The different type of devices accessed at school might lead to different uses and skills development in the school environment.

Table 1. **Percentage of students with no access to digital devices, by country and location (Fiji, Republic of Korea, Viet Nam)**

Country	Home (%)	School (%)
Fiji	7.1	18.2
Republic of Korea	1.2	7.8
Viet Nam	0.8	14.6

Source: UNESCO. (2019). *Digital kids Asia-Pacific: Insights into children's digital citizenship.*

The age of first device access varies, but is often reported to be when children are around 10–12 years old, and access increases with age.[27] More than 30 per cent of 15-year-old students in Viet Nam reported having used digital devices for three to four years, while 44.4 per cent reported more than five years' use.[28] This is corroborated by research in Cambodia which found that the older the adolescent, the higher the rate of personal ownership of a smartphone, with up to 31 per cent ownership among adolescents aged 15–19 years compared with only 6 per cent for those aged 10–12 years.[29] There appear to be significant differences for girls and boys in rural areas, however, as they tend to gain access later and have less access overall (see 'The urban/rural access divide', Chapter 2).

At a national level, the difference between girls' and boys' digital access varies widely across the region. This is illustrated in a study that disaggregated data on youth internet use by sex for a number of countries across the region (see Table 2).[30] The data show that a gender gap in favour of boys may be particularly prevalent across the Pacific. Yet it is important to note that even where national data do not indicate significant gender gaps, these may still exist at a sub-national level.

Table 2. **Internet use by sex, ages 15-24 years, for low-and middle-income countries across East Asia and the Pacific.**

Country	Internet Use: Female	Internet Use: Male	Gender Parity Ratio (F/M)	Source	Year
Papua New Guinea	20.3%	24.9%	0.82	DHS	2016-18
Timor-Leste	35.8%	40.3	0.89	DHS	2016
Lao People's Democratic Republic	43.6%	41.1%	1.06	MICS	2017
Samoa	55.5%	78.4%	0.71	MICS	2019-20
Kiribati	61.3%	53.5%	1.15	MICS	2018-19
Tonga	78.5%	89.5%	0.88	MICS	2019
Fiji	85.1%	85.8%	0.99	MICS	2021
Tuvalu	87.1%	90.1%	0.97	MICS	2019-20
Mongolia	89.5%	82.7%	1.08	MICS	2018
Viet Nam	91.9%	88.9%	1.03	MICS	2020-21

Source: UNICEF. (2023). *Bridging the gender digital divide: Challenges and urgent call for action for equitable digital skill development.*

Girls and boys appear to have similar levels of digital access when factors associated with marginalization are limited or absent.[31] Research conducted in the Philippines with children aged 9–17 years who were already using the internet highlighted that girls had equal mobile phone access and slightly greater internet access at home and school than boys did.[32] Similarly, research with 15-year-old students in Bangladesh, Fiji, the Republic of Korea and Viet Nam found girls had more access to digital devices at home and school, and spent more time online than boys (see Figure 2).[33]

26 UNESCO. (2019). *Digital kids Asia-Pacific: Insights into children's digital citizenship.*
27 UNICEF. (2019). *Gender counts: A quantitative assessment of gender inequality and its impact on girls and boys in East and Southeast Asia.*
28 UNESCO. (2019). *Digital kids Asia-Pacific: Insights into children's digital citizenship.*
29 Indochina Research Ltd. (2016). *On adolescent engagement in Cambodia.*

30 UNICEF. (2023). *Bridging the gender digital divide: Challenges and urgent call for action for equitable digital skill development.*
31 For examples of studies across the region referring to this, see: ChildFund Vietnam. (2021). *Swipe Safe phase II: Gender analysis report* [Unpublished]; UNICEF. (2019). *Gender counts: A quantitative assessment of gender inequality and its impact on girls and boys in East and Southeast Asia*; UNICEF. (2022). *Learning loss in the Covid-19 pandemic era: Evidence from the 2016–2021 grade six national learning assessment in Cambodia.*
32 Livingstone, S., Kardefelt-Winther, D., & Saeed, M. (2019). *Global kids online comparative report* (Innocenti Research Report).
33 UNESCO. (2019). *Digital kids Asia-Pacific: Insights into children's digital citizenship.* This trend is broadly similar across countries, apart from Fiji, where a larger percentage of boys than girls reported time spent online in categories above 3+ hours a day.

However, girls in full-time education or who are 'already using internet' may not be representative of the wider population, particularly those experiencing social or economic exclusion.

Figure 2. **Time spent online at home, 15-year-old students, by gender (Bangladesh, Fiji, Republic of Korea, Viet Nam)**
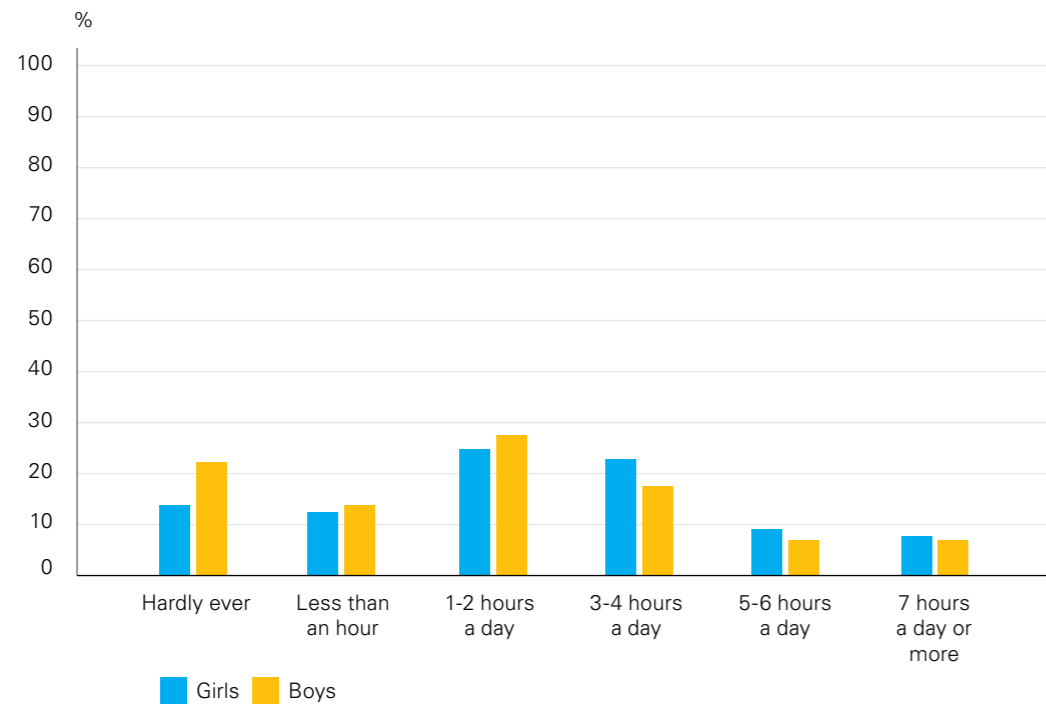
Source: UNESCO. (2019). *Digital kids Asia-Pacific: Insights into children's digital citizenship.*

Girls from more marginalized populations may have lower levels of digital access. A study conducted in 25 countries, including two that are the focus of this report (Indonesia and the Philippines), found adolescent boys were 1.5 times more likely than adolescent girls to own a mobile phone and 1.8 times more likely to own a smartphone.[34] More than half (52 per cent) of girls in the study had to borrow mobile phones if they wanted digital access, compared with 28 per cent of boys. Girls' access was also found to be complex, as it was often compromised by devices with poor functionality and could be transient, as phones were lost, broken or stolen.[35]

This study differs from those previously referenced, as it included adolescents who had very limited or no device access, and who satisfied vulnerability criteria including being out of school and from low-income backgrounds. While the findings from this study are perhaps not applicable to other countries in the East Asia and Pacific region, it illustrates the potential for certain populations' digital access and use to remain invisible to policymakers and other key stakeholders. Thus, further research with these populations is recommended.

Girls' digital use

Girls and boys tend to use digital devices for a few basic activities focused on entertainment and communication, and also for some information-seeking.[36] Activities include making calls, sending and receiving messages, watching and sharing videos, and playing games. Social media is key to their online experience, with platforms including YouTube, TikTok, Facebook, WhatsApp, Instagram, Line and Zalo providing the foundations for adolescents' digital repertoire. For example, high school students in Cambodia reported that they used their smartphones mostly for media consumption, including social networking (83 per cent), entertainment (79 per cent) and reading news (70 per cent).[37] This reflects global trends in adolescents' use of technology.

> " *Young people dream big, so they want to set up businesses, learn new skills, but they actually use small, particularly girls but even boys, are mostly watching videos on YouTube, or sharing it with someone to watch, and sending some messages… For those with sporadic, limited access especially, there's a chasm between what they do and what they know they could be doing.* "
>
> *- (Girl Effect employee, key informant interview, December 2022)*

Older adolescents tend to engage more online than younger adolescents. This is demonstrated by a study conducted with adolescents aged 11–19 years in Cambodia, Indonesia, Malaysia and Thailand, which found that older adolescents more actively engaged in WhatsApp groups, games and generation of content. These activities included "YouTube channels dedicated to dance moves (and lessons), guitar lessons, Qur'anic verse instruction, make-up, or gaming strategy, as well as in several instances, selling goods online".[38] Separate research in Viet Nam also found that students in upper secondary school reported using the internet more frequently for almost all activities than those in lower secondary school.[39] Only 61.5 per cent of lower secondary school boys and 70.8 per cent of lower secondary school girls were using social media, compared with 88.8 per cent of boys and 90.7 per cent of girls in upper secondary school (see Figure 3).[40] This study also highlights that girls reported using social media at a slightly higher rate than boys, which is consistent with the data in Table 2, which show a higher rate of female internet use among 15–24-year-olds in Viet Nam. The gender gap appears to reduce for those in upper secondary school, but more research would be needed to understand whether this is significant.

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34 Girl Effect & Vodafone Foundation. (2018). Real girls, real lives, connected. Countries included: Angola, Bangladesh, Benin, Colombia, Ghana, Guatemala, India, Indonesia, Iraq, Jordan, Kenya, Liberia, Malawi, Mexico, Myanmar, Nigeria, Pakistan, Peru, the Philippines, Republic of Congo, Rwanda, South Africa, Tanzania, Thailand, USA.

35 Both girls and boys in the study experienced a range of barriers to access, but girls particularly experienced social norms barriers related to negative perceptions of girls' phone use and widespread safety concerns, and thus girls' access was often more restricted.

36 ChildFund Vietnam. (2021). *Swipe Safe phase II: Gender analysis report* [Unpublished]; Kardefelt-Winther, D., Livingstone, S., & Saeed, M. (2019). *Growing up in a connected world* (Innocenti Research Report); UNICEF. (2020). *Our lives online: Use of social media by children and adolescents in East Asia – Opportunities, risks and harms*; UNICEF. (2021). *Adolescent engagement and skills acquisition in digital spaces: Understanding opportunities, empowerment, and inclusion online.*

37 UNDP. (2020). *Digital literacy for employability and entrepreneurship among Cambodian youth: Assessment report.*

38 UNICEF. (2020). *Our lives online: Use of social media by children and adolescents in East Asia – Opportunities, risks and harms.*

39 ChildFund Vietnam. (2021). *Swipe Safe phase II: Gender analysis report* [Unpublished].

40 In Viet Nam, lower secondary school refers to ages 11–15 years (or approximately Grades 6–9) while upper secondary school refers to ages 15–18 years (Grades 10–12).

Figure 3. **Social media use by education level and gender (Viet Nam)**
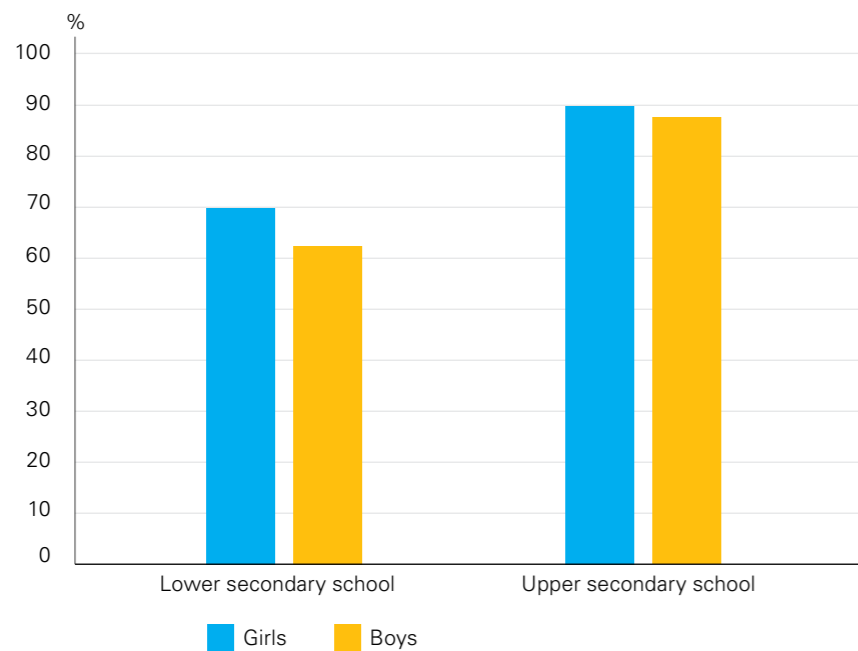
Source: ChildFund Vietnam. (2021). Swipe Safe phase II: Gender analysis report [Unpublished].

Girls also tend to engage slightly differently from boys online, which may be the result of gender norms guiding the content they seek out and consume. Research with adolescents in Indonesia, Malaysia, the Philippines and Thailand found that girls spent more time shopping or browsing e-commerce websites (46 per cent) compared with boys (28 per cent).[41] They were also more engaged in content related to the domestic sphere (e.g., cooking and taking care of the family) and to their physical appearance (e.g., make-up, skincare and beauty). By contrast, boys were more engaged with online gaming. This was corroborated by research with upper secondary students in Viet Nam, which found that girls were looking more for goods or prices, whereas boys were playing more online games.[42] Girls also used the internet more for social networking and studying for school, though this difference was not always significant across the study.

Online safety

Girls and boys across the region have been exposed to risk and had negative experiences online. Research conducted with adolescents in Cambodia, Indonesia, Malaysia and Thailand found that 7 out of 10 had been upset by online experiences over the past year.[43] These experiences included exposure to obscene photos, violent videos (e.g., school fights and car accidents) and horror (e.g., ghosts). Hoaxes and misinformation were also mentioned across all four countries, although they were found to be a particular concern for young people in Indonesia. These findings are corroborated by research with adolescents in Indonesia, Malaysia, the Philippines and Thailand, which highlighted that all participants reported facing cyberbullying online.[44]

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[41] UNICEF. (2021). *Adolescent engagement and skills acquisition in digital spaces: Understanding opportunities, empowerment, and inclusion online.*

[42] ChildFund Vietnam. (2021). *Swipe Safe phase II: Gender analysis report* [Unpublished].

[43] UNICEF. (2020). *Our lives online: Use of social media by children and adolescents in East Asia – Opportunities, risks and harms.*

[44] UNICEF. (2021). *Adolescent engagement and skills acquisition in digital spaces: Understanding opportunities, empowerment, and inclusion online.*

Girls' experience of risk online differs from that of boys to a certain extent. This difference is evident in the aforementioned study with adolescents in Indonesia, Malaysia, the Philippines and Thailand, which found that girls and those from LGBTQIA+ communities faced gender-based risks and threats online. These included being body-shamed and experiencing unwanted sexual advances.[45] By contrast, boys reported trash-talking and cyberbullying in gaming environments, exposure to sexualized images of women, exposure to images of violence, and falling prey to scams and account hacking.

Girls also tend to experience some risks slightly more than boys. For example, research with students in Viet Nam found that girls received friend requests from strangers significantly more than boys did (85.7 per cent versus 75.1 per cent respectively). Similarly, a higher proportion of girls received sexual, threatening or offensive messages or pictures; were exposed to stigma related to their physical appearance; were cyberbullied; and were threatened with violence due to online conflicts.[46]

Figure 4. **Online risks experienced at least once in the last 12 months, by gender (Viet Nam)**

Source: ChildFund Vietnam. (2021). *Swipe Safe phase II: Gender analysis report* [Unpublished].

Significantly, girls tend to feel more at risk online than boys. Adolescent girls in Indonesia, Malaysia, the Philippines and Thailand reported feeling less safe online than boys did (32 per cent versus 26 per cent respectively).[47] Research with students in Viet Nam also highlighted that girls considered themselves more at risk due to their choice of online activities.[48] Girls were perceived to spend more time on social media, engaged in activities focused on connecting with others and sharing personal information, which were viewed as potentially high-risk.

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[45] Ibid.

[46] ChildFund Vietnam. (2021). *Swipe Safe phase II: Gender analysis report* [Unpublished].

[47] UNICEF. (2021). *Adolescent engagement and skills acquisition in digital spaces: Understanding opportunities, empowerment, and inclusion online.*
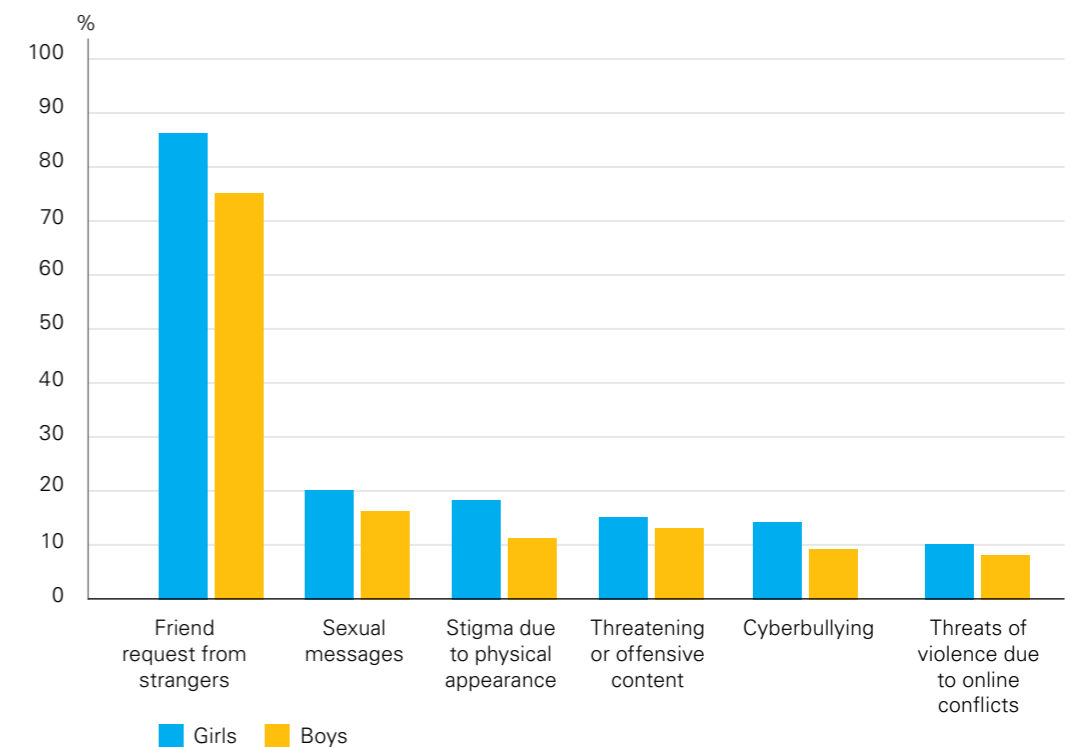
[48] ChildFund Vietnam. (2021). *Swipe Safe phase II: Gender analysis report* [Unpublished].

Adolescents across the region view digital literacy as important to their future, yet often feel they possess only basic digital competence. This was highlighted in a survey with 8,000 young people aged 10–24 years across the ASEAN region, 61 per cent of whom identified as female.[49] There appeared to be some variations along economic lines, as young people in the least developed countries perceived digital literacy to be least important to their future and had the lowest confidence in their ability. Only 5 per cent of young people in Cambodia and Myanmar perceived their digital literacy as excellent, compared with 40 per cent in Brunei. Notably, there was no significant difference between girls and boys in their assessment of their own digital literacy or its importance.[50]

Indeed, girls and boys often possess only basic digital competence, primarily focused on consuming information online, for leisure and entertainment. This is exemplified in research conducted with adolescents in Indonesia, Malaysia, the Philippines and Thailand, which found they were confident navigating social media and performing basic search functions on Google.[51] They were also gaining some skills through their use of social media – for example, those associated with communication and team-building. However, participants in the research struggled with other types of platforms, such as Microsoft Suite, Zoom, Google Meets, Google Drive and Microsoft Office, as these required further skills that they lacked. Additionally, they struggled to use online tools for work or study activities and reported feeling overwhelmed by the amount of information online, as they did not know how to navigate or evaluate this information. Key informants interviewed for this report similarly observed that both girls and boys often lack digital skills related to content creation and manipulation.

> " *I've found that while many young girls are on social media, not many know how to use the internet or devices in a purposeful way, such as for education or empowerment.* "
>
> - (Southeast Asia University Partnership Programme employee, Timor-Leste, key informant interview, December 2022)

[49] UNICEF. (2020). Digital literacy in education systems across ASEAN: Key insights and opinions of young people.

[50] Given the methodology and sampling approach used in this study, the survey data provide valuable insights on youth trends but cannot be regarded as representative of young people in each country, or across the region.

[51] UNICEF. (2021). Adolescent engagement and skills acquisition in digital spaces: Understanding opportunities, empowerment, and inclusion online.

Girls and boys often have similar levels of digital literacy during primary and secondary education. The International Computer and Information Literacy Study (ICILS) 2013 assessment, which was conducted in 21 countries including Hong Kong, China, the Republic of Korea and Thailand, showed that at primary and lower secondary education level the gender gap in digital competence was either non-existent or in favour of girls.[52] Similarly, research with 15-year-old students in Bangladesh, Fiji, the Republic of Korea and Viet Nam found that girls scored higher across all digital domains assessed (see Table 3).[53] Key informants interviewed for this report also observed that girls' performance, interest and motivation to learn was often similar to or greater than boys'.

> " We don't see a difference in our projects between girls and boys in terms of capacity or levels of excitement to learn. They are both very interested to go to class to learn about programming and coding, and their quality of work is the same. "
>
> - (Vietnet-ICT employee, Viet Nam, key informant interview, December 2022)

Table 3. Digital domain mean scores, by gender (Bangladesh, Fiji, Republic of Korea, Viet Nam)

	Girls	Boys
Digital Literacy[54]	3.19	3.13
Digital Safety and Resilience	3.46	3.40
Digital Participation and Agency	3.04	2.97
Digital Emotional Intelligence	3.15	3.09
Digital Creativity and Innovation	2.74	2.69

Source: UNESCO. (2019). *Digital kids Asia-Pacific: Insights into children's digital citizenship.*

It is important to note that the studies referenced above were conducted with girls in full-time education, and thus they may not represent the wider population, particularly children experiencing social or economic exclusion. There is limited data quantifying the digital literacy of adolescents affected by factors commonly associated with marginalization (e.g., poverty, limited access to education, and having a disability). Consequently, it is not possible in this report to assess how digital literacy varies among girls and boys from these populations.

[52] Fraillon, J., Ainley, J., Schulz, W., Friedman, T., & Gebhardt, E. (2014). *Preparing for life in a digital age: The IEA international computer and information literacy study international report.*

[53] UNESCO. (2019). *Digital kids Asia-Pacific: Insights into children's digital citizenship.* In this survey, respondents were scored on a range of 1 (disagree a lot), 2 (disagree a little), 3 (agree a little) and 4 (agree a lot) for their responses to questions related to the five categories listed in Table 3. Hence the higher the score, the more positive the response.

[54] This study includes digital literacy as one of five digital domains that fall under the concept of 'digital citizenship'. However, for the purposes of this report, all five digital domains are relevant.

Critically, further studies show that a gender gap in favour of boys appears to develop as young people progress through education, and it is evident in more advanced digital competences. For example, a study conducted with 15-year-old students in Lao PDR found that girls had significantly lower scores than boys in the more advanced competences of Digital Emotional Intelligence and Digital Creativity and Innovation.[55] This is further corroborated by studies that explore how the gender gap increases with skill level, in favour of men, among adults.[56] Key informants also highlighted these differences, observing that as young people progress through education, girls tend to feel science, technology, engineering and mathematics (STEM) courses are less relevant to them, and so participate less over time (see 'Technology as a male domain', Chapter 2).

> " At the user level, girls and boys appear to have the same level of proficiency and excel similarly, if they are in the same kind of school setting… But at the tech creation level (I'm speaking also as someone who runs a tech company), I just wish I could have more female programmers, testers, etc. "
>
> - Vietnam employee, Viet Nam, key informant interview, December 2022)

Online safety

Girls and boys who use digital devices often have at least some online safety competence. Research with 15-year-old students in Fiji, Indonesia, Lao PDR, the Republic of Korea and Viet Nam showed they scored highest in Digital Safety and Resilience versus other digital domains including Digital Participation and Agency, and Digital Creativity and Innovation.[57] This tendency is corroborated by a study conducted with children aged 9–17 years who were using the internet in the Philippines, as they reported strong privacy skills in managing their interpersonal relationships online.[58] Additionally, many had developed strategies to protect themselves online and were aware that they needed to consider certain risks when using the internet. These studies were conducted with children and adolescents who were in full-time education or already had internet access, so therefore may not be representative of the wider population, particularly more marginalized populations.

Girls' online safety competence differs slightly from boys' because of the activities they choose to engage in and the risks they are concerned about. For example, research with students in Viet Nam found that both girls and boys had general knowledge about online safety skills, but girls knew how to block messages and social network accounts at slightly higher rates than boys did, although the statistical significance was small (see Figure 5).[59]

Figure 5. Knowledge of online safety skills, by gender (Viet Nam)

Source: ChildFund Vietnam. (2021). *Swipe Safe phase II: Gender analysis report* [Unpublished].

However, girls may not progress to more advanced digital safety competence to the same extent as boys. The aforementioned study in Viet Nam found that when the data were filtered to include only upper secondary students, they showed that boys knew how to recognize real and fake messages at a significantly higher rate than girls (57.8 per cent versus 45.6 per cent respectively), and also were more likely to know how to set multi-layer security for personal online accounts (66.5 per cent versus 51.0 per cent respectively).[60]

Additionally, girls from more marginalized populations may have less online safety competence overall. Research with adolescents in Indonesia, Malaysia, the Philippines and Thailand found that girls from rural areas were less likely to effectively protect themselves, owing to limited knowledge.[61] Similarly, a study conducted in 25 countries, including two that are the focus of this report (Indonesia and the Philippines), found that those with less digital access and social support were also less able to mitigate risks associated with phone use.[62] These girls often lacked the support mechanisms to deal with harassment or bullying, and avoided apps and features that they believed would expose them to danger. While avoidance may limit their exposure, it does not support girls to develop the online safety skills needed to mitigate risk.

> " For the group of children and adolescents who are students, who have access to digital devices, it's about how they interact with the information, learn the skills, maybe transferrable skills, critical thinking and so on, to decode the messages that they're exposed to. At the same time there's this group of vulnerable children and young people that need more resources and support to improve their digital awareness and basic skills. "
>
> - (UNICEF Viet Nam employee, consultation session, November 2022)

55 SEAMEO. (2021). *Digital kids Asia-Pacific: Insights into the digital lives of children – National report Lao PDR*.
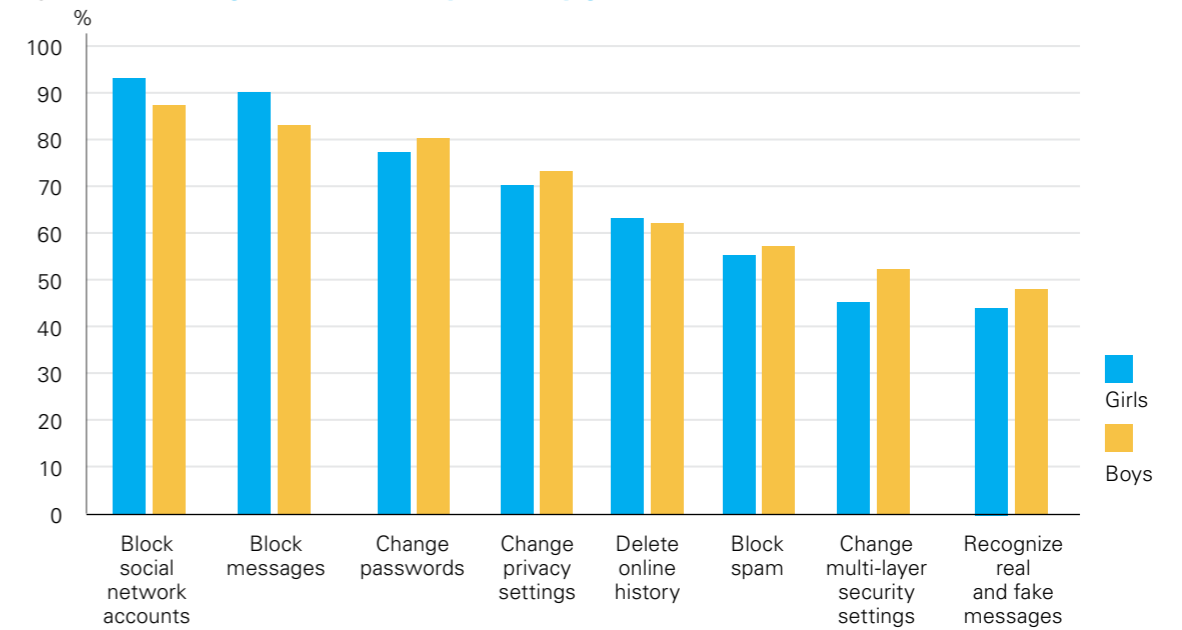
56 For examples among adults see: EQUALS & UNESCO. (2019). *I'd blush if I could: Closing gender divides in digital skills through education*.

57 UNESCO. (2019). *Digital kids Asia-Pacific: Insights into children's digital citizenship*; SEAMEO. (2021). *Digital kids Asia-Pacific: Insights into the digital lives of children – National report Lao PDR*; SEAMEO. (n.d.). *Policy brief: Insights into children's digital lives in Indonesia*. In this study, Digital Safety and Resilience refers to the ability of children to protect themselves and others from harm in the digital space. Digital Participation and Agency refers to the ability to equitably interact, engage and positively influence society through ICT. Digital Creativity and Innovation refers to the ability of children to express themselves and explore through the creation of content using ICT tools.

58 Kardefelt-Winther, D., Livingstone, S., & Saeed, M. (2019). *Growing up in a connected world* (Innocenti Research Report).

59 ChildFund Vietnam. (2021). *Swipe Safe phase II: Gender analysis report* [Unpublished].

60 Ibid.

61 UNICEF. (2021). *Adolescent engagement and skills acquisition in digital spaces: Understanding opportunities, empowerment, and inclusion online*.

62 Girl Effect & Vodafone Foundation. (2018). *Real girls, real lives, connected*.

Digital literacy development: Learning modalities, enablers and barriers

This chapter begins by describing how adolescents develop their digital literacy through a combination of self-learning and social learning, both of which have an important role to play. The remainder of the chapter outlines factors that act as enablers or barriers to the learning process, focusing on access, language and sociocultural norms. The discussion highlights how a lack of access to infrastructure, devices and data can pose a barrier to adolescents across the region, particularly in rural areas. It then describes how language issues can also act as a barrier, particularly for adolescents less familiar with English.

Later sections explore the role of sociocultural norms in specifically limiting girls and their opportunities to learn. Stereotypical gender roles can affect girls' confidence, motivation and interest in developing more advanced digital competences; and concerns about girls' online safety can lead gatekeepers (e.g., parents and caregivers) to impose restrictions on use, thus limiting opportunities for digital literacy development. The chapter also highlights some innovative programmes aiming to address these sociocultural norms within the community.

⦿ **How do girls and boys develop digital literacy?**

Figure 6. Digital literacy learning modalities

Self-learning   **Social learning**
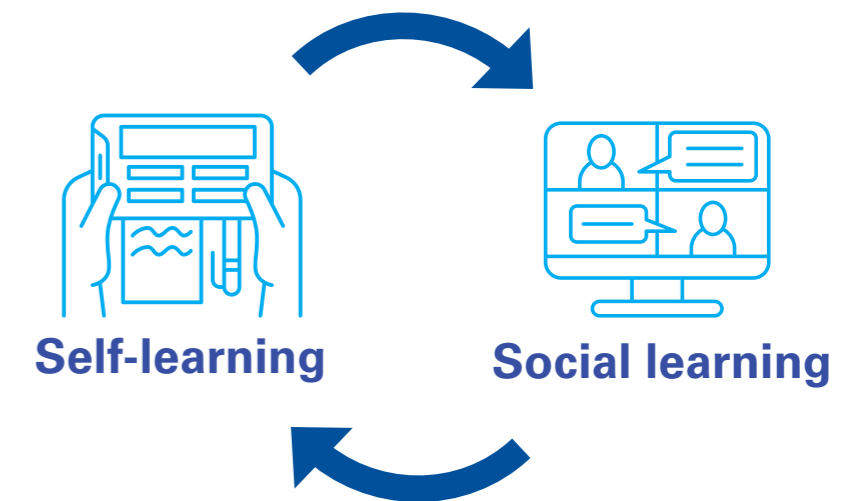
Self-learning and social learning

The evidence does not suggest any significant differences between girls and boys in how they develop their digital literacy. Adolescents across the region tend to develop their digital literacy through a combination of learning modalities that help them to grow and progress. These include self-learning, where they practise and experiment by themselves, and social learning, where they learn via what others in their network suggest and show them.

Self-learning plays a significant role in adolescents' digital literacy development. Research with 15-year-old students found that those who reported learning how to use the internet by themselves formed the highest proportion of respondents in the Republic of Korea (68.3 per cent), Viet Nam (67.9 per cent) and Fiji (39.8 per cent).[63] A similar pattern emerged when they were asked how they learned to use computers.

Watching tutorials online and practising through experimentation are key components of self-learning. Research in Indonesia, Malaysia, the Philippines and Thailand found adolescents partly developed their digital skills through watching YouTube and Facebook videos, and experimenting through trial and error.[64] They were also seeking bite-sized, visual content on user-friendly platforms for learning and productive tasks more generally. Similarly, research with high school students in Cambodia found 39 per cent reported they were regular ICT self-learners, and the most popular form of self-study involved watching YouTube tutorials.[65]

Self-learning may be particularly relevant to those who have already developed some basic digital skills. Research with adults found self-learning was especially important to those who were more confident experimenting and who have already mastered the basics (e.g., turning the device on and off, navigating device interfaces, and playing videos).[66] This is because self-learning tends to require some basic digital knowledge, particularly when it involves video tutorials, as the learner must know how to navigate to the videos and play them.

Social learning is also important to adolescents' digital literacy development. A survey with 8,000 young people aged 10–24 years across the ASEAN region (61 per cent of whom identified as female) found that support from others, particularly friends and siblings, played a key role in helping young people to develop their digital literacy.[67] This is corroborated for girls specifically by a study conducted in 25 countries, including two that are the focus of this report (Indonesia and the Philippines).[68] It found that girls' social networks, particularly family, friends and peers, played an important role in helping them learn how to use mobile phones. These social networks were also involved in increasing girls' awareness of the relevance that phones could have in their lives, which was crucial in driving their motivation and interest to learn.

Parents and caregivers tend to play a smaller role in the learning process for adolescents, and teachers even less of a role. Research with 15-year-old students in Viet Nam found that just 9 per cent reported receiving suggestions from parents or caregivers on how to use the internet safely, and only 4.7 per cent received this type of assistance from teachers.[69]

The limited role that teachers play in the learning process may reflect trends in device access. Mobile phones are the primary, and in some cases only, device that young people have access to, and they are largely associated with out-of-school, personal use. Thus, children and young people may not deem teachers relevant to digital skills development when they are learning via a mobile device.

Social support may be particularly important at the beginning of the learning journey. Research with adults found that social networks played a key role during these early stages, because new learners often lacked confidence in handling digital devices and required more encouragement and practical support.[70]

The interplay between self-learning and social learning

Both self-learning and social learning have important roles to play in adolescents' digital literacy development. Self-learning is key to adolescents developing an interest in technology and growing their digital abilities. The Global Kids Online study, which was conducted with children aged 9–17 years across 11 countries, including one that was the focus of this report (the Philippines), found that playing games, watching videos and engaging on social media helped build children's digital capacities, which enabled them to develop the interest and skills to progress further.[71] Similarly, research with high school students in Cambodia found that self-study contributed significantly to students' digital literacy, as self-learners scored higher on most competence areas than those who only depended on school curricula.[72]

By contrast, social learning provides important practical support in the early stages and expands adolescents' awareness and understanding of opportunities for further digital skills development. This was highlighted in the aforementioned Global Kids Online study, which found that many children did not progress beyond basic digital competence levels involved in playing games and watching videos online.[73] The authors suggest that "whether such activity leads to a narrow absorption in game playing alone or expands to also include other online activities may depend less on the individual child and more on her or his family, existing support networks and the prevailing digital culture". Both girls and boys may therefore need social support to ensure they progress to more advanced digital competences that enable them to use technology for higher-order activities such as problem-solving, critical thinking and creativity.[74]

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63 UNESCO. (2019). *Digital kids Asia-Pacific: Insights into children's digital citizenship*.
64 UNICEF. (2021). *Adolescent engagement and skills acquisition in digital spaces: Understanding opportunities, empowerment, and inclusion online*.
65 UNDP. (2020). *Digital literacy for employability and entrepreneurship among Cambodian youth: Assessment report*.
66 GSM Association (GSMA). (2021). *Developing mobile digital skills in low- and middle-income countries*; GSM Association (GSMA). (2021). *Understanding people's mobile digital skills needs: Insights from India and Ghana*.
67 UNICEF. (2020). *Digital literacy in education systems across ASEAN: Key insights and opinions of young people*.
68 Girl Effect & Vodafone Foundation. (2018). *Real girls, real lives*, connected.
69 UNESCO. (2019). *Digital kids Asia-Pacific: Vietnam country report*.

70 GSM Association (GSMA). (2021). *Developing mobile digital skills in low- and middle-income countries*; GSM Association (GSMA). (2021). *Understanding people's mobile digital skills needs: Insights from India and Ghana*.
71 Kardefelt-Winther, D., Livingstone, S., & Saeed, M. (2019). *Growing up in a connected world (Innocenti Research Report)*.
72 UNDP. (2020). *Digital literacy for employability and entrepreneurship among Cambodian youth: Assessment report*.
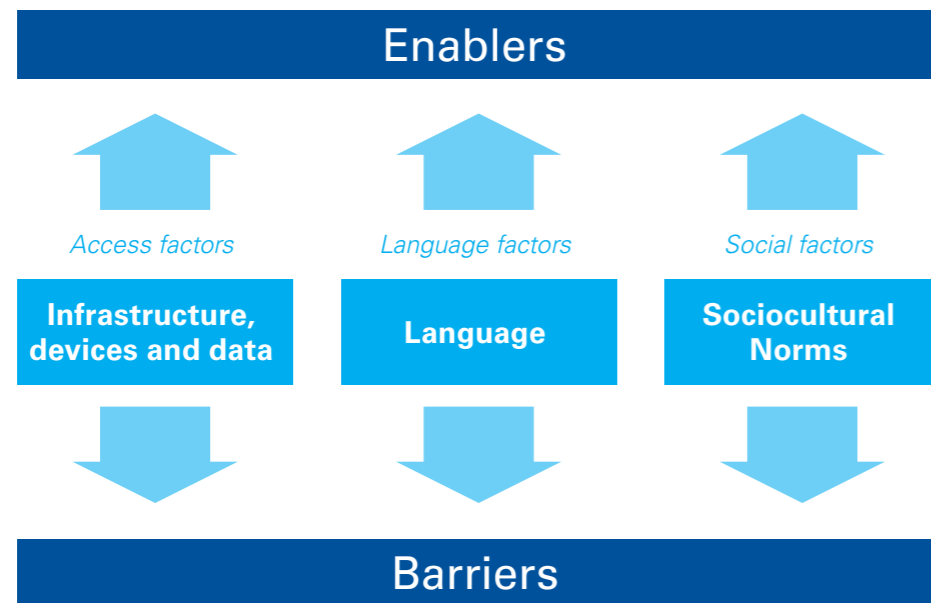73 Kardefelt-Winther, D., Livingstone, S., & Saeed, M. (2019). *Growing up in a connected world (Innocenti Research Report)*.
74 Kardefelt-Winther, D., Livingstone, S., & Saeed, M. (2019). Growing up in a connected world (Innocenti Research Report); OECD. (2019). *The role of education and skills in bridging the digital gender divide: Evidence from APEC economies*.

What are the enablers and barriers?

Three main factors act as enablers and barriers to girls' digital literacy development. The way these factors show up in girls' lives influences whether they act as enablers or barriers.

Figure 7. **Key enablers and barriers to girls' digital literacy development**

Access to infrastructure, devices and data can pose significant barriers for both girls and boys across the region, particularly in low-income households and rural areas. This was highlighted in a survey with 8,000 young people aged 10–24 years across the ASEAN region (61 per cent of whom identified as female). The survey found that limited availability of technical resources and infrastructure were perceived as major barriers to digital literacy development.[78] Similarly, research with adolescent girls and boys in Indonesia, Malaysia, the Philippines and Thailand showed that many participants, especially those in low-income households, did not have adequate access to appropriate devices for learning, or sufficient data, which limited the quality and time spent online.[79] Significantly, 90 per cent of participants had access to smartphones at home, but poor internet connectivity, data costs and low levels of household access to laptop and desktop computers were found to limit their opportunities for activities such as online learning.

The urban/rural access divide

Adolescents in rural areas across the region experience significant and multilayered barriers to access. Infrastructure issues present a major concern, as key informants observed that in Cambodia, Lao PDR, Timor-Leste and Viet Nam, electricity supply and internet connectivity continued to be a challenge in rural areas. This was highlighted as a particular issue for the mountainous regions of Lao PDR and Viet Nam.

> " A number of infrastructure challenges make digital literacy quite difficult, including unreliable and limited electricity outside of major urban areas. "
>
> - (UNICEF Timor-Leste employee, consultation session, December 2022)

Additionally, affordability issues affect low-income households, particularly in rural areas, and can limit their ability to purchase data or devices. In Lao PDR and Timor-Leste especially, key informants observed that broadband and data costs presented a significant barrier, particularly for rural populations.[80] These populations were consequently limited in the types of activities they could engage in online and the amount of time they could spend using internet services.

> " The internet in Laos is prohibitively expensive. "
>
> - (UNICEF Lao PDR employee, consultation session, December 2022)

Similarly, digital devices can be prohibitively expensive for low-income households, particularly among rural populations. Key informants in Viet Nam observed that young people in rural areas therefore often did not own smartphones until they were older (e.g., 14 years old), whereas in urban areas key informants felt that children tended to gain

Access to infrastructure, devices and data

Access is a key enabler of adolescents' digital literacy development when it is present and a significant barrier when it is absent. Several studies show a positive relationship between adolescents' exposure to digital devices and their digital literacy. For example, research with 15-year-old students in Fiji, the Republic of Korea and Viet Nam found that higher frequency of use was positively associated with the development of competences including Digital Literacy, Digital Participation and Agency, and Digital Creativity and Innovation.[75] Additionally, exposure to digital devices from a younger age was positively associated with higher competences in Digital Literacy, Digital Safety and Resilience, Digital Emotional Intelligence, and Digital Creativity and Innovation. This supports findings from the ICILS 2013 assessment that one additional year of computer experience contributed to a nine-point increase in digital literacy.[76]

The type of device accessed also influences the level of digital literacy that adolescents develop. Mobile phones are by far the most accessible device for girls and boys. However, some of the form factors of a mobile phone, such as the task-supportive interface, also constrain certain types of activity – for example, the intensive creation and manipulation of content.[77] Consequently, adolescents who have 'mobile-only' access may be limited in the level of digital literacy they can develop, particularly in relation to content creation.

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75 UNESCO. (2019). *Digital kids Asia-Pacific: Insights into children's digital citizenship.* This study includes digital literacy as one of five digital competences that fall under the concept of 'digital citizenship'. However, for the purposes of this report, all five digital competence areas are relevant.

76 Fraillon, J., Ainley, J., Schulz, W., Friedman, T., & Gebhardt, E. (2014). *Preparing for life in a digital age: The IEA international computer and information literacy study international report.* Cited in UNESCO. (2019). Digital kids Asia-Pacific: Insights into children's digital citizenship.

77 For further discussion on this, see Donner, J. (2016). *After access: Inclusion, development, and a more mobile internet.*

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78 UNICEF. (2020). *Digital literacy in education systems across ASEAN: Key insights and opinions of young people.*

79 UNICEF. (2021). *Adolescent engagement and skills acquisition in digital spaces: Understanding opportunities, empowerment, and inclusion online.*

80 Love Frankie, Oxfam, & The Asia Foundation. (2022). *Digital youth in Timor-Leste.*

access and ownership at a much younger age (e.g., as young as 6 years old).[81] A similar theme was observed by key informants in Cambodia, Indonesia, Lao PDR and Timor-Leste.

Schools in rural areas are often also poorly equipped for teaching ICT. In Cambodia, Lao PDR and Timor-Leste, key informants observed that this was a challenge for the public school system more broadly, but particularly in rural areas. In Cambodia, the government tried to address this issue by setting up School Resource Centres, which included computer labs, for public schools to use across the country. However, there were still not enough computers available within the public school system for children to access them more than once a month.[82] This limits the opportunity for public school students to engage in incremental learning via desktop or laptop devices, or to see the relevance of this type of device in their everyday lives.

> **"** The rural schools are often one-room buildings with no glass in the windows. The Ministry of Education, Youth and Sport, with help from donors, installed approximately 200 computer labs, with maybe 20 computers each, so that's around 4,000 computers. But the population is 75 per cent below 35 years old. So it's really a privilege to have access to a computer lab in the public schools. **"**
>
> - (Sisters of Code employee, Cambodia, key informant interview, November 2022)

In Viet Nam students in rural areas are often at a distinct disadvantage compared with those in urban areas. Key informants observed that public schools in urban areas often had the facilities to teach ICT and could request parent donations to support the purchase of equipment where it was lacking. Students also had extracurricular opportunities to develop their digital skills, through after-school clubs and ICT training centres in the community. In rural areas, though, schools tended to have limited or in some cases no ICT facilities and could not effectively request parent donations, owing to low incomes in the community. Additionally, there were fewer extracurricular opportunities like after-school clubs or ICT training centres in the community.[83]

> **"** Infrastructure and lack of facilities is a significant issue in rural areas but not in urban areas. It depends on the budget of the province and the schools, so it is very difficult for rural areas. For example, in 2017, when I visited Hoa Binh province, in the mountainous area, it was very poor. I saw that in one school they only had one room for ICT classes, and they only had five computers. They were old, slow, running XP, outdated. There are poor conditions for the schools in rural areas. **"**
>
> - (Vietnet-ICT employee, Viet Nam, key informant interview, December 2022)

Language
The language of instruction, and the language that digital content is written or spoken in can act as barriers in instances where adolescents are not sufficiently familiar with them. The extent that language acts as a barrier varies across the region and can affect both girls and boys.

In locations where English is widely spoken, language barriers tend to play less of a role, because a broad selection of English-language content is available, along with instructional materials, such as ICT textbooks, written in English. However, in locations where English is not widely spoken, the language barriers tend to be greater, as digital content and instructional materials are not readily available in local languages. For example, research in Cambodia found that 72 per cent of high school students reported insufficient English-language literacy as the top challenge in ICT learning, because most instructional materials were in English.[84] Similarly, key informants in Indonesia observed that students participating in their training programmes tended to find it easier if they understood English, because the relevant online digital content was mostly in English.[85]

> **"** We find that those students who understand English tend to perform better. It will be easier for them to find references on the internet, because most of the learning materials are in English, and the documentation for the coding is also in English, so they have an advantage. **"**
>
> - (Markoding employee, Indonesia, key informant interview, December 2022)

This issue is amplified in countries such as Lao PDR, where there are a wide range of local dialects, and in remote areas even the national language may not be very familiar to some girls and boys.[86] Furthermore, in countries where the national language does not use the Latin script, there can be additional challenges, for example related to the keyboard. Key informants in Lao PDR observed that keyboards in Lao script are not easy to find.[87] Language barriers may be particularly relevant to adolescents who have lower levels of education, as they are likely to have lower levels of traditional literacy.

Sociocultural norms

Technology as a male domain
Sociocultural norms can act as a barrier to girls' digital skills development by reinforcing stereotypical gender roles that limit the scope of girls' aspirations and signal that 'technology is a male domain'. These norms do not appear to influence girls' everyday use of mobile phones, perhaps because these devices are often associated with more basic use, focused on communication and entertainment. However, they have a clear impact on girls' confidence and motivation to develop more advanced digital competences, their selection of STEM subjects in school, and their future career choices in the technology space.

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[81] ChildFund Vietnam. (2022). Key informant interview. Note: key informant interview data provide anecdotal evidence and do not claim to be representative.

[82] MoEYS, Cambodia. (2022). Key informant interview; Sisters of Code, Cambodia. (2022). Key informant interview.

[83] Vietnet-ICT, Viet Nam. (2022). Key informant interview; CFC Vietnam. (2022). Key informant interview; ChildFund Vietnam. (2022). Key informant interview.

[84] UNDP. (2020). *Digital literacy for employability and entrepreneurship among Cambodian youth: Assessment report.*

[85] Markoding, Indonesia. (2022). Key informant interview.

[86] Aide et Action, Lao PDR. (2022). Key informant interview.

[87] UNICEF Lao PDR. (2022). Consultation session.

> 66 Girls generally have similar access to ICT education, but sociocultural norms often discourage them from pursuing STEM subjects. 99

- (UNICEF Timor-Leste employee, consultation session, December 2022)

> 66 There are not observable differences between girls and boys in terms of learning and their scores/performance … But when it comes to confidence levels, boys are better than the girls. 99

- (Markoding employee, Indonesia, key informant interview, November 2022)

Children across the region are often raised to believe that women's primary role is within the home, which therefore limits their opportunities outside of this domain. For example, research with young people aged 10–24 years in Indonesia, Lao PDR and Thailand found that girls reported being expected to balance their education and employment aspirations with an unequal share of domestic work.[88] This was similarly observed by key informants in Timor-Leste.[89]

These expectations can limit girls' opportunities to participate in education or training more broadly. As such, girls across the region are more likely than boys to be not in education, employment or training (NEET), and therefore limited in their opportunities for skills development.[90]

These sociocultural norms also position technology as a distinctly male domain within education and the professional sphere. For example, children are often raised to believe that STEM subjects are inherently more masculine, and thus boys and men are considered innately better at them.[91] Women are instead expected to engage in low-skilled, 'caring' roles, and therefore STEM subjects and professions are perceived to be irrelevant to girls' lives. For instance, in the aforementioned research with young people aged 10–24 years in Indonesia, Lao PDR and Thailand, they felt that women were limited to professions such as teachers, vendors, cooks, cleaners and tailors.[92] The young people also thought that women faced negative stigma if seen to be too 'ambitious' in their professional aspirations. These views were similarly observed by key informants interviewed for this report in Cambodia and Viet Nam.

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88 UNDP, & UNICEF. (2021). *Addressing gender barriers to entrepreneurship among girls and young women in South-East Asia.*

89 Southeast Asia University Partnership Programme, Timor-Leste. (2022). Key informant interview.

90 UNICEF. (2019). Gender counts: A quantitative assessment of gender inequality and its impact on girls and boys in East and Southeast Asia.

91 UNESCO. (2020). STEM education for girls and women: Breaking barriers and exploring gender inequality in Asia.

92 UNDP, & UNICEF. (2021). Addressing gender barriers to entrepreneurship among girls and young women in South-East Asia.

> 66 When girls join us, we do a survey to understand the barriers they are facing, their assumptions. Many think boys are naturally better with technology than them, so there are biases around what girls can and can't do. 99

- (Sisters of Code employee, Cambodia, key informant interview, December 2022)

> 66 People think the tech career is for boys, and that boys can do it better. 99

- (Vietnet-ICT employee, Viet Nam, key informant interview, December 2022)

This perception of 'technology as a male domain' can affect girls' confidence in their digital capabilities from a young age. The ICILS 2013 assessment, which was conducted in 21 countries including Hong Kong, China, the Republic of Korea and Thailand, showed that despite performing similarly to boys on measures of digital skills in primary and lower secondary education, girls had lower levels of self-efficacy (confidence or self-perceived ability).[93] Additionally, the gap between girls' performance and their self-efficacy increased with the level of task complexity. Key informants in Cambodia, Indonesia, Timor-Leste and Viet Nam similarly observed that although girls' digital proficiency was often comparable to boys', their lack of confidence presented a significant barrier to their progression.

> 66 Another barrier for girls is their confidence – even though they can technically do it, they don't think that they can do it. 99

- (Generation Girl employee, Indonesia, key informant interview, November 2022)

> 66 The biggest barrier for girls is a lack of confidence and the economic situation of the country. 99

- (Southeast Asia University Partnership Programme employee, Timor-Leste, key informant interview, December 2022)

> 66 Girls are stereotyped into thinking and saying, 'Maybe this is too hard for me to learn.' 99

- (CFC Vietnam employee, Viet Nam, key informant interview, November 2022)

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93 Fraillon, J., Ainley, J., Schulz, W., Friedman, T., & Gebhardt, E. (2014). Preparing for life in a digital age: The IEA international computer and information literacy study international report; OECD. (2019). The role of education and skills in bridging the digital gender divide: Evidence from APEC economies.

The perception of 'technology as a male domain' also influences girls' interest and motivation to pursue STEM subjects further. For example, research with students in Viet Nam found that even though girls liked STEM subjects and perceived themselves to perform well at ICT, they did not tend to choose related fields for their future educational development or subsequent careers.[94] Similarly, research with girls in Singapore found that 37 per cent of those aged 17–19 years reported they would not choose STEM professions, despite studying STEM subjects. Girls aged 12–19 years cited reasons including disinterest (68 per cent) and perceptions that STEM subjects were difficult (42 per cent). Additionally, 49 per cent believed that girls were less likely to choose STEM subjects because of the perception that STEM jobs were male-dominated.[95]

⭕ **Addressing perceptions that technology is a male domain.** Some NGOs in the region aim to address these barriers as part of their extracurricular digital education programming. They use innovative techniques to encourage girls' motivation and interest, build their confidence and empower them to believe in their digital capabilities.

These techniques include:

- **Female role models and mentors:** Women who are already working in the technology domain are integrated as role models and mentors, to address stereotypes and demonstrate that technology provides a possible career pathway for girls. These women aim to provide support and inspiration to girls as they progress. Role models who are 'closer' (in age, background and level of career progression) may have the most impact, as they are easier for girls to identify with.[96]

- **Project-based learning:** Students engage in interactive and practical projects. This encourages them to use their own motivation and creative thinking to complete assignments, which can build their self-confidence. Additionally, this approach supports students to develop a range of soft skills that are important to digital literacy, including critical thinking and problem-solving.

- **Focusing on real-world, relevant problems:** Students are often encouraged to choose a real-world problem to address in their project through the development of technology (e.g., apps and websites). This helps them to see the relevance and importance technology can have in their lives.

- **Safe, supportive learning environments:** Some programmes are only open to girls, which can ensure they feel comfortable expressing themselves during the learning process. Even when programmes include girls and boys, emphasis is put on ensuring the environment is collaborative, non-judgemental and fun, to encourage girls' participation.

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94 UNESCO. (2020). *STEM education for girls and women: Breaking barriers and exploring gender inequality in Asia.*
95 Mastercard. (2017). *Inspiring Girls in STEM: Mastercard's Girls4Tech™ Program to Reach More than 13,000 Girls in Singapore by 2018.*
96 Generation Girl, Indonesia. (2022). Key informant interview.

Examples of NGOs working on this in the region include:

Sisters of Code, Cambodia

Sisters of Code provides extracurricular training for female students aged 10–20 years, particularly those in public schools, through an 18-week programme in creative computing.[97] The organization creates a safe space for girls to learn through project-based activities. Girls choose the problems they will address through development of apps and websites. Female trainers, mentors and role models also support them throughout the process. Sisters of Code aims to address wider community perceptions by engaging with parents and caregivers ahead of girls' participation, holding graduation events for parents and caregivers to attend, and engaging youth ambassadors in the community.

Generation Girl, Indonesia

Generation Girl introduces girls and women to STEM from an early age through a range of fun and innovative programmes, including holiday clubs and hackathons.[98] It focuses on creating a safe community space for girls to learn through student-centred, project-based approaches. The organization uses technology to simultaneously develop soft skills, including critical thinking and problem-solving. Generation Girl recently introduced a 'flipped classroom' approach, to ensure in-class sessions are fully focused on practical activities. It also delivers content in bite-size portions, to avoid overwhelming participants. Female role models and mentors are engaged to support and inspire girls further.

Markoding, Indonesia

Markoding, in partnership with UNICEF Indonesia, conducts a 12-month skills development programme called the 'Innovation Challenge', for adolescent girls and boys aged 12–18 years.[99] The aim is to empower underprivileged youth with twenty-first-century skills, through co-creation of digital solutions for positive change in local communities. Adolescents are first exposed to role models from the technology sector, before collaborating in teams to devise a technology solution for a local issue of their choice. Teams are then selected to attend a bootcamp, where they receive intensive digital skills training in order to develop their ideas. At this stage, girls are matched with female mentors to support their progression. Finally, teams showcase their digital innovations to relevant ministries, provincial officials, the private sector and other young people at a 'Demo Day'.

> " In terms of their confidence, the female mentors have a clear positive impact. "
>
> - (Markoding employee, Indonesia, key informant interview, November 2022)

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[97] Sisters of Code, Cambodia. (2022). Key informant interview.
[98] Generation Girl, Indonesia. (2022). Key informant interview.
[99] Markoding, Indonesia. (2022). Key informant interview.

Concerns about online safety

Perceptions of safety and risk are key to how girls engage with digital devices, and the access that gatekeepers (e.g., parents and caregivers) allow them. Concerns about online safety often negatively affect girls' digital access, use and skills development.

However, there is some nuance around digital safety concerns, depending on the device type and context. For example, key informants in Viet Nam observed that mobile phones are often considered by parents and others to be more concerning, because they are associated with personal use and are challenging to monitor. By contrast, laptop and desktop computers, especially in the school environment, are perceived positively, because they are associated with education and can be more easily monitored by teachers.[100]

Parent and caregiver safety concerns can present a significant barrier to girls' access, particularly to mobile phones. For example, a study conducted in 25 countries, including two that are the focus of this report (Indonesia and the Philippines), found that almost half (47 per cent) of girls with limited access identified parents' safety concerns as the reason they did not own a mobile.[101]

Girls' use also tends to be monitored and restricted more than boys' because of these concerns. Research with students in Viet Nam found 90 per cent reported parents and caregivers monitored their internet use, and girls' text messages were more commonly checked than boys'.[102] This finding is corroborated by research with adolescents in Indonesia, Malaysia, the Philippines and Thailand, which highlighted that girls' online activity was more closely monitored by family members, especially in Indonesia.[103] Girls reported supervision of the time they spend online, reminders not to upload 'sexy videos' or images of themselves, and prompts to be careful while communicating with others online. By contrast, boys did not report any family supervision, other than to provide online learning support.

Parents' own lack of digital literacy may also present a barrier, preventing them from being able guide their children's digital use and thus leading them to restrict it instead. A study conducted in seven countries in East and West Africa, and South Asia found that parents often had limited digital literacy themselves and did not feel equipped to manage their children's online safety and wellbeing.[104] Similar findings were reported in research with parents and caregivers in the Philippines.[105] These challenges were similarly observed by key informants in Cambodia, Lao PDR, Timor-Leste and Viet Nam.

> " Another challenge for many students is that their parents do not have knowledge of ICT, so they cannot help them with questions …
> Also, they cannot protect their children from the dangers of the internet, since they do not know so much about it themselves. "
>
> - (Ministry of Education, Youth and Sport employee, Timor-Leste, key informant interview, December 2022)

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[100] CFC Vietnam. (2022). Key informant interview.
[101] Girl Effect & Vodafone Foundation. (2018). *Real girls, real lives, connected.*
[102] ChildFund Vietnam. (2021). *Swipe Safe phase II: Gender analysis report* [Unpublished].
[103] UNICEF. (2021). *Adolescent engagement and skills acquisition in digital spaces: Understanding opportunities, empowerment, and inclusion online.*
[104] Girl Effect. (forthcoming).
[105] Livingstone, S., Kardefelt-Winther, D., & Saeed, M. (2019). *Global kids online comparative report* (Innocenti Research Report).

Girls are very aware of safety as an issue and can internalize these concerns, self-limiting their own use. The aforementioned study that was conducted in 25 countries including Indonesia and the Philippines underscores this point, as 16 per cent of girls reported that girls do not own phones because they see them as unsafe.[106] The aforementioned research conducted across seven countries in East and West Africa, and South Asia found that some girls limited their self-expression online because of these concerns about online safety.[107] Similarly, in East Asia, research with adolescents in Indonesia, Malaysia, the Philippines and Thailand found that girls were more conscious of their online presence, suggesting more limiting beliefs about what they can do online.[108]

> **❝** Fears around online safety prevent girls from creating their own content, or participating more meaningfully online, compared to boys. Boys don't seem to have as many fears about putting a video out there or showing their face online or being more present. Whereas girls are more likely to say they'll never make it about themselves online because of the potential backlash. **❞**
>
> - (Girl Effect employee, key informant interview, December 2022)

Parental restrictions and self-limitation can prevent the development of girls' digital literacy, including the growth of their knowledge and skills around online safety. This was demonstrated by a study conducted with children aged 9–17 years in 11 countries, including one that is the focus of this report (the Philippines).[109] The research found that when parents imposed restrictions, children engaged in fewer online activities and tended to have weaker digital skills overall, and specifically in relation to online privacy.

Girls who experience restrictions may therefore have weaker online safety knowledge and skills, which puts them at greater risk when they do use digital devices. This is particularly concerning, as restrictions may lead some girls to use digital devices 'in secret' and not tell those around them when they experience harm.[110] Key informants in Viet Nam confirmed this problem, observing that when girls experienced harm online, they often kept this secret, owing to shame and fear of being blamed.[111]

> **❝** Girls seem to keep cases where they've experienced harmful activity on the internet a secret; they will not share it with parents. They think their parents will blame them. Some parents blame them because they think the children have the problem because they have spent a lot of time online rather than learning. **❞**
>
> - (ChildFund Vietnam employee, Viet Nam, key informant interview, November 2022)

Addressing online safety concerns.

It is critical to engage gatekeepers (e.g., parents and caregivers) in providing guidance and support for girls' use rather than simply restricting it. The aforementioned study, which was conducted in 11 countries including the Philippines, highlights that supportive, 'enabling' approaches are likely to be most effective for digital literacy development, including the advancement of online safety knowledge and skills.[112]

Parents and caregivers may need help developing their skills, to build their confidence and knowledge about enabling strategies and the tactics that girls can use to stay safe online.

> **❝** Greater parental online confidence could result in greater youth confidence. If parents are afraid, they will stop their kids, and their kids are afraid. Whereas if parents are confident and show their kids how to use it safely, and show them appropriate things to be doing online then there will be a cyclical effect. **❞**
>
> - (Girl Effect employee, key informant interview, December 2022)

Several NGOs in Viet Nam provide promising examples of programmes that address online safety concerns and support parents and caregivers to provide guidance for young people's digital engagement. These initiatives target extracurricular opportunities for online safety training, as this was perceived to be a gap in the national curriculum (see 'Education frameworks and curricula', Chapter 3). In some cases, these organizations also collaborate with the private sector, and particularly technology companies such as Meta and Google, to develop these programmes.

> **Examples include:**
>
> ⦿ **ChildFund Vietnam, Swipe Safe**
> This initiative aims to prevent online abuse and exploitation of children by mobilizing parents, youth, schools and the private sector to play an active role in children's online safety. It provides information to caregivers about the internet, how to use it, how to support children to use it, and how to develop skills for safety online. Future activities will explore how to strengthen the relationship between children and parents/caregivers, so that girls and boys feel able to share when they are experiencing online harm.[113]
>
> ⦿ **Vietnet-ICT in collaboration with Meta, We Think Digital**
> This initiative aims to equip students, parents and teachers with the skills to move beyond digital literacy into responsible digital citizenship. It provides training courses and educational materials on how to be an online citizen, covering matters such as private information, reputation, wellbeing, behaviour, thinking and communication. Vietnet-ICT has developed a toolkit of materials for teachers, including training guidelines, slides, videos and quizzes. It also offers Train the Trainer sessions and uses a network of youth ambassadors to engage young people.[114]

106 Girl Effect & Vodafone Foundation. (2018). *Real girls, real lives, connected.*
107 Girl Effect. (forthcoming).
108 UNICEF. (2021). *Adolescent engagement and skills acquisition in digital spaces: Understanding opportunities, empowerment, and inclusion online.*
109 Livingstone, S., Kardefelt-Winther, D., & Saeed, M. (2019). *Global kids online comparative report* (Innocenti Research Report).
110 Girl Effect. (forthcoming); Girl Effect & Vodafone Foundation. (2018). *Real girls, real lives, connected.*
111 ChildFund Vietnam. (2022). Key informant interview. Livingstone, S., Kardefelt-Winther, D., & Saeed, M. (2019). Global kids online comparative report (Innocenti Research Report).

112 Livingstone, S., Kardefelt-Winther, D., & Saeed, M. (2019). Global kids online comparative report (Innocenti Research Report).
113 ChildFund Vietnam. (2022). Key informant interview.
114 Vietnet-ICT, Viet Nam. (2022). Key informant interview.

Digital literacy education: Pedagogies, policies and curricula

This chapter begins by highlighting the influence of 'digital learning' on the digital literacy education landscape. It then describes the techniques used, and challenges that exist, in teaching digital literacy. Teachers often use didactic and theory-based techniques that have limited effectiveness in teaching digital literacy. Some also have gaps in their own digital literacy, which can limit their teaching capacity. Issues with teaching quality may particularly affect girls, as current approaches to teaching digital literacy appear to be largely gender-blind and thus do not address sociocultural norms that limit girls specifically.

Later sections explore how digital literacy education is considered an integral component of digital transformation efforts across the region. Governments recognize digital literacy as key to ensuring students are prepared for the labour market, but a lack of digital access and issues with teaching quality can present a challenge to including it in national curricula. The chapter ends by highlighting that concepts of 'equity and inclusivity' are a key consideration in digital literacy education planning, which presents an opportunity to ensure girls' specific needs and challenges are addressed through the lens of equity and inclusion for all.

The influence of 'digital learning'

Across the region there is a significant focus on the role and potential of 'digital learning'. A by-product of engaging with digital learning solutions can be an increase in digital literacy.[115] However, the purpose of these solutions is generally to aid the learning of other subjects (e.g., mathematics and science) rather than to target students' digital literacy development specifically.[116]

Box 2. Defining 'digital learning'

The term 'digital learning' is interchangeable with 'digital education', and although there is no universally agreed definition, it tends to encompass any learning that is facilitated, enabled or mediated using technology.[116] For example, it can include learning through use of websites, e books, social media and online communities, online lectures, webinars and video tutorials. In reference to formal education, it can encompass use of technology in the classroom (e.g., projectors and tablets) and outside the classroom (e.g., mobile phones). The latter is often referred to as 'remote learning', yet it is important to note that remote learning can also incorporate non-digital modalities (e.g., radio programmes and worksheets).

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115 UNESCO. (2018). Building tomorrow's digital skills: What conclusions can we draw from international comparative indicators?
116 Chartered Institute of Personnel and Development (CIPD). (2022, December 9). Digital learning.

The emphasis on digital learning appears to be a consequence of the COVID-19 pandemic, which led to the urgent introduction and uptake of remote learning solutions across the world.[117] Key informants interviewed for this report observed that this has led to a renewed emphasis on the importance of upskilling students to be able to engage with technology generally, and digital learning solutions specifically.[118]

The influence that digital learning has on digital literacy education differs by country. In countries such as Cambodia, Lao PDR and Timor-Leste, where there is limited access to ICT facilities within the public school system and the focus on ICT in education is nascent, key informants emphasized the role of digital learning in spearheading the focus on digital literacy, and the recent developments aimed at supporting this. By contrast, in countries such as Viet Nam, where access to ICT facilities within the public school system is more widespread and an ICT curriculum has been implemented for a number of years, key informants highlighted the actions already being taken to support digital literacy development among students, regardless of any digital learning solutions.

○ Pedagogy: Techniques and challenges
Didactic and theoretical approaches to teaching digital literacy
In countries across the region, teachers in formal education institutions often use didactic, teacher-centred approaches to teaching digital literacy. This method appears to be linked to traditional teaching practices common across the wider education landscape. For example, research in Indonesia highlights that historically, the education system has required teachers to refer to textbooks and adhere to a fixed syllabus set by the Ministry of Education and Culture, which left minimal opportunity to explore other teaching and learning modalities.[119] Key informants involved in extracurricular digital literacy training programmes in Cambodia, Indonesia and Viet Nam also observed that project-based, student-centred learning approaches were often a new experience for students.[120]

> " We want to change the way the teachers are teaching and interacting with the children, as it is currently very traditional (one-way, lecturing). "
>
> - (ChildFund Vietnam employee, Viet Nam, key informant interview, November 2022)

> " Our programme is project-based, so it's a different approach from the traditional education system here. "
>
> - (Sisters of Code employee, Cambodia, key informant interview, December 2022)

The reliance on traditional approaches may partly be due to a lack of knowledge or teacher training on how to teach digital literacy. For example, a study in Indonesia discovered that at primary and secondary level, most training programmes did not equip teachers with

the pedagogical knowledge to formulate ICT learning materials or implement ICT across school subjects.[121] Similarly, data from the online teacher survey conducted for this report show that 64 per cent of teachers in Cambodia and 63 per cent in Timor-Leste reported they did not receive training on digital devices or the internet. The survey data suggest a much higher percentage of teachers in Viet Nam did receive training (81 per cent), but key informants in Viet Nam observed that teachers in rural areas particularly lack opportunities to develop their teaching methods.[122]

> " In rural areas especially, student-centred approaches are quite new for teachers. Teachers in rural areas don't have a lot of opportunity to improve their teaching methods. "
>
> - (Vietnet-ICT employee, Viet Nam, key informant interview, November 2022)

> " Our experience with the Learning Passport highlighted that even when tools are available, teachers need training on how to leverage new available materials. In fact, there are quite a few resources teachers could use but don't have adequate knowledge on how to use. "
>
> - (UNICEF Timor-Leste employee, Timor-Leste, consultation session, December 2022)

Theory-based approaches to digital literacy education also tend to be used in the absence of accessible ICT facilities, and thus are particularly common in rural areas (see 'The urban/rural access divide', Chapter 2). These approaches can exacerbate the didactic nature of digital literacy education. In some countries, such as Cambodia, limited access to ICT facilities in the public school system more generally means that students rely heavily on using worksheets for digital literacy education.[123] In countries such as Viet Nam, theory-based approaches are more common in rural areas, where ICT facilities are limited. [124]

> " In rural areas especially, they don't have access to internet, computers, mobile phones, the tools to use in class to make activities more fun and interactive. So, it's teacher-centred, from textbooks. They learn to code on paper. Especially in the difficult rural areas like the mountains. "
>
> - (Vietnet-ICT employee, Viet Nam, key informant interview, November 2022)

[117] UNICEF Data. (2020). *COVID-19: Are children able to continue learning during school closures?*
[118] UNESCAP. (2022). Key informant interview; UNICEF Lao PDR. (2022). Consultation session; UNICEF Cambodia. (2022). Consultation session.
[119] UNICEF. (2021). *Situation analysis on digital learning in Indonesia.*
[120] Sisters of Code, Cambodia. (2022). Key informant interview; Generation Girl, Indonesia. (2022). Key informant interview; ChildFund Vietnam, Viet Nam. (2022). Key informant interview.

[121] SMERU Research Institute, United Nations Economic and Social Commission for Asia and the Pacific (ESCAP), & Digital Pathways at University of Oxford. (2022). *Accelerating digital skills development in Indonesia: Strategy primer.*
[122] Vietnet-ICT, Viet Nam. (2022). Key informant interview.
[123] MoEYS, Cambodia. (2022). Key informant interview; Sisters of Code, Cambodia. (2022). Key informant interview.
[124] CFC Vietnam. (2022). Key informant interview; Vietnet-ICT. (2022). Key informant interview; ChildFund Vietnam. (2022). Key informant interview.

Box 3. Spotlight on Cambodia: Worksheets

The Government of Cambodia has been using workarounds to teach ICT to public school students, despite challenges with a lack of resources and limited device access. ICT is included within 'technical education' and taught primarily through the use of worksheets (i.e., theoretically). The Ministry of Education, Youth and Sport aims for these worksheets to be shared with students ahead of class, either on paper or via digital channels for those with access. The goal is for students to bring the completed worksheets to class, enabling teachers to identify student challenges and address them in the classroom.[125]

> " The worksheets are to try to encourage the students, and also the parents, to help together to bring their kids to study. "
>
> - (Ministry of Education, Youth and Sport employee, Cambodia, key informant interview, November 2022)

Teachers' digital literacy

A lack of digital literacy among teachers can present a significant barrier to the cultivation of digital literacy among their students. Low digital literacy among teachers is made evident partly through their inability to adopt digital learning solutions. Research in Indonesia found that educators' ability to integrate digital learning into their teaching was stymied by their low level of pre-existing digital literacy.[126] Similarly, key informants in Lao PDR highlighted the challenges of introducing digital learning solutions, owing to the low digital literacy of teachers.[127]

> " We really struggle with the digital literacy level of teachers in Laos … with teachers, digital literacy is a challenge, but so is general awareness and media literacy as they are new to the online world (especially if they are above 40 years old), so they don't know the difference between real and fake news. "
>
> - (UNICEF Lao PDR employee, Lao PDR, consultation session, November 2022)

These findings are mirrored in data from the online teacher survey conducted for this report in Cambodia and Timor-Leste. Only 5 per cent of teachers in Cambodia rated their digital literacy as 'highly capable', compared with 66 per cent who felt their digital literacy was basic or slightly more than basic. In Timor-Leste, only 12 per cent felt confident about using digital devices in their lessons.

By contrast, teachers in Viet Nam appear more familiar and confident with using digital technology. Data from the online teacher survey conducted for this report show that 44

per cent felt confident using digital devices and the internet in their lessons.[128] However, separate research conducted in Viet Nam found that teachers often had limited knowledge about online safety, which suggests a potential gap to be addressed.[129] This finding is corroborated by key informants in Viet Nam, who observed that teachers were eager for online safety training materials and had provided feedback that the materials they had received aided their own online safety knowledge.[130]

> " *We've been working with the Ministry of Education and Training to introduce the Google online safety curriculum – Be Internet Awesome – for elementary school children. We're training teachers to introduce it into schools … The feedback we've received is good; the teachers appreciate it because they weren't previously equipped with the information. As I mentioned it's a new subject in Viet Nam.* "
>
> - (CFC Vietnam employee, Viet Nam, key informant interview, November 2022)

In some instances, older teachers appear to struggle more with their digital literacy. For example, key informants in Indonesia observed that younger teachers' willingness to incorporate digital learning into their teaching was partly a result of their higher digital literacy levels. Similarly, key informants engaged in implementing digital learning solutions in Lao PDR observed that older teachers tended to have lower levels of digital literacy and less openness to learn.[131] These observations are supported by data from the online teacher survey, which show that in Cambodia, only 7 per cent of teachers aged 18–24 years were not comfortable with digital devices or the internet, compared with 19 per cent of 35–50-year-olds and 24 per cent of those over 51 years old.

Box 4. Spotlight on Cambodia: Sharing knowledge through teacher networks

The Government of Cambodia has been using workarounds to tackle low digital literacy among teachers in the immediate term. Public school teachers do not specialize in teaching ICT, but the Ministry of Education, Youth and Sport has been identifying those who have more digital expertise. Those teachers then participate in an ICT/digital learning team, where they collate best practice and are encouraged to share their knowledge with other teachers.

> " For teaching ICT, we build up a team that say how to help all teachers to use ICT … It starts with teachers with a background in ICT, in STEM, in using digital platforms. They can then help their group– it's the power of one. "
>
> - (Ministry of Education, Youth and Sport employee, Cambodia, key informant interview, November 2022)

125 MoEYS, Cambodia. (2022). Key informant interview.
126 UNICEF. (2021). *Situation analysis on digital learning in Indonesia*.
127 UNICEF Lao PDR. (2022). Consultation session; Aide et Action, Lao PDR. (2022). Key informant interview.
128 Note: The online survey data for Viet Nam are not representative.
129 ChildFund Vietnam. (2021). *Swipe Safe phase II: Gender analysis report* [Unpublished].
130 CFC Vietnam. (2022). Key informant interview; Vietnet-ICT, Viet Nam (2022). Key informant interview.
131 UNICEF Lao PDR. (2022). Consultation session; Aide et Action, Lao PDR. (2022). Key informant interview.

Gender considerations

Gender is not a consideration for most teachers when teaching digital literacy. This suggests that teachers either do not recognize the gender differences highlighted in previous chapters or have not been trained to do so. The teaching of digital literacy therefore appears to be largely gender-blind. This could act as a further barrier to girls' digital literacy development, given the sociocultural norms that need to be addressed to support girls' progression to more advanced digital competences.

Data from the online teacher survey conducted for this report demonstrate that the majority of teachers in Cambodia, Timor-Leste and Viet Nam did not perceive any differences in how girls were taught compared with boys, and nor did they feel that differences between girls and boys needed to be considered (see Table 4). This finding is corroborated by separate research conducted with teachers in Viet Nam, which found that they had not paid much attention to gender-equality issues; for example, there were no specific measures to involve girls in STEM-related activities.[132]

These teacher attitudes may be based to a certain extent on perceptions that girls and boys perform similarly in using digital devices. Data from the online teacher survey show that 51 per cent of teachers in Cambodia and 40 per cent in Timor-Leste felt there was no difference between girls and boys in terms of their performance (33 per cent and 46 per cent had no opinion, respectively). The survey's free responses in Timor-Leste further indicated perceptions that there was no difference between girls and boys in their ability to learn or use digital devices. By contrast, the free responses in Cambodia highlighted slight differences, as boys in some cases were considered better than girls in using technology, but girls were perceived to be more attentive, focused and motivated to learn.

Implicit gender bias is more apparent among survey respondents in Viet Nam, although it must be noted that the survey data cannot be considered representative. Despite the majority of teachers responding that gender differences do not need to be considered, 26 per cent reported that they felt girls performed worse than boys in using digital devices (see Table 4). When the rationale was explored through the free responses, teachers stated that boys used mobile phones more, and were faster to learn, more confident and more interested.

This finding is corroborated by separate research with teachers in Viet Nam, which identified significant bias among teachers, who believed STEM careers were not suitable for girls.[133] Key informants in Indonesia have similarly observed gender bias among teachers during recruitment for their training programme, where some teachers questioned whether advanced digital skills might be too complex for girls.[134]

> " Some teachers ask, 'Is it really complex for girls?' They think it will be too sophisticated, too complex for their students and especially for girls. The teachers have some stigma that coding and digital skills are for boys only. "
>
> - (Markoding employee, Indonesia, key informant interview, November 2022)

Table 4. Teachers' consideration of gender, by country (Cambodia, Timor-Leste, Viet Nam)

Survey question	Cambodia	Timor-Leste	Viet Nam
Do you see any differences in the ways that girls and boys are taught to use digital devices and the internet at your school? (%, 'no')	79%	73%	70%
Do you feel that skills for using digital devices and the internet need to be taught in a way that considers differences between girls and boy? (%, 'no')	84%	57%	72%
How well do you feel girls perform in using digital devices and the internet, compared to boys? (%, girls perform worse than boys)	6%	1%	26%

Source: Online survey data collected for this study. (2022).

This gender bias may also be slightly more prevalent among female teachers. Data from the online teacher survey show that a higher proportion of female teachers thought girls performed worse than boys in using digital devices, across Cambodia, Timor-Leste and Viet Nam. Additionally, a lower proportion of female teachers reported that gender needed to be considered when teaching how to use digital devices. This finding is corroborated by separate research with teachers in Viet Nam, which found greater gender bias among female teachers.[135]

Importantly, there do not appear to be many measures in place to address potential gender bias. Key informants interviewed for this study struggled to identify any measures that are addressing gender bias in teaching practice, and observed that gender bias generally stemmed from and needed to be addressed within the wider community. These observations highlight the importance of looking outside the education system to address harmful gender norms and perceptions. However, the use of gender-blind approaches within education reinforces regional reports that suggest education systems can at times limit rather than encourage girls' digital literacy, by perpetuating gender stereotypes about use of technology.[136]

These gender-blind approaches stand in stark contrast to some of the extracurricular digital literacy training programmes being implemented by NGOs across the region. Key informants interviewed for this study who were involved in such programmes described various gender-responsive techniques used (see 'Addressing perceptions that technology is a male domain', Chapter 2, for examples). They also highlighted how associated training materials were designed to be gender-sensitive (e.g., use of textbook images that avoid perpetuating gender stereotypes, such as men in STEM roles and women in care-giving roles). Thus, education systems could benefit from collaborating with these types of actors, particularly where they can provide support with teacher training on gender-responsive techniques and pedagogies.

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132 UNESCO. (2020). STEM education for girls and women: Breaking barriers and exploring gender inequality in Asia.
133 UNESCO. (2020). STEM education for girls and women: Breaking barriers and exploring gender inequality in Asia.
134 Markoding, Indonesia. (2022). Key informant interview.

135 UNESCO. (2020). *STEM education for girls and women: Breaking barriers and exploring gender inequality in Asia.*
136 OECD. (2019). The role of education and skills in bridging the digital gender divide: Evidence from APEC economies.

Addressing pedagogical challenges through digital learning solutions. Several NGOs across the region have been exploring how to use innovative digital learning solutions to address challenges in teaching quality. These solutions aim to shift the emphasis from didactic, theory-based learning to a more engaging, interactive and student-centred experience.

Examples include:

⊙ AEAI, Lao PDR

Aide et Action International (AEAI) aims to use technology to empower teachers and improve student learning outcomes in Lao PDR.[137] Its approach uses the national curriculum as the basis for digital content, which it formats in a way that encourages interactivity and collaboration. AEAI supports the set-up of one e-classroom per school, which includes an LCD screen, connector cable and tablets (four students per tablet on average). The content is made accessible via an app on Google Play Store so that it can also be used outside the classroom on Android devices. The app and content are preloaded onto tablets to circumvent connectivity issues. This solution does not target digital literacy development, but it provides children with exposure to and use of digital devices and content.

⊙ CFC Vietnam

The Center for Consultancy on Family Health and Community Development (CFC) Vietnam, in collaboration with UNICEF Viet Nam, sought to develop a fun and interactive digital learning solution that encouraged students, and particularly girls, to engage with STEM.[138] Preschool, primary and lower secondary schools were provided with augmented virtual reality (AVR) technology, including tablets and phone-mounted glasses, so that children could collaborate in small groups (five to six children) on STEM-related subjects. A key focus was to empower teachers in rural areas, and female ethnic minority students in STEM learning. This solution has the potential to provide schools with a cost-effective alternative to physical labs, while building teachers' and students' capacity to use technology and engage with STEM.

⊙ Policy: Strategies, frameworks and curricula

Digital policies and strategies

Countries across the region are engaging in large-scale digital transformation efforts, which include updated digital policies at national and sectoral levels. Digital literacy education strategies are a key component of these policies, but in countries such as Cambodia and Lao PDR they are still in the early stages of development and thus their focus and content has not been finalized.[139]

For example, in Lao PDR a recent digital maturity assessment (DMA), conducted by the United Nations Development Programme (UNDP) to evaluate the current potential for digital government, indicated that government ministries were at a 'nascent stage' of digital transformation.[140] However, since the COVID-19 pandemic this has become a high priority for the government, and as such, it is making 'good progress' towards becoming 'digitally emerging'. Alongside other member states in 2022, Lao PDR also adopted the Declaration on the Digital Transformation of Education Systems in ASEAN and has been collaborating with UNICEF on the development of Khang Panya Lao, a nationwide digital learning platform.[141] The Ministry of Education and Sport (MoES) is in the process of developing its ICT strategy, but this has not yet translated into a national curriculum, in part owing to challenges with infrastructure and device access in schools, which also need to be addressed.[142]

Digital education policies in some countries across the region are managed by multiple ministries or, alternatively, are in development across multiple ministries. For example, in 2021 the Government of Indonesia introduced the Digital National Roadmap, which includes digital skills development as a core focus.[143] This roadmap is managed by the Ministry of Information and Communication (MIC), which is responsible for the connectivity aspects, and the Ministry of Education, Culture, Research and Technology (MoECRT), which focuses on content, platforms and digital learning.[144] By contrast, in Cambodia, the Ministry of Innovation and Technology, the Ministry of Telecommunications and the Ministry of Education, Youth and Sport are engaged in developing separate digital education policies and frameworks.[145] This will require careful co-ordination to ensure there is no overlap.

Education frameworks and curricula

Governments across the region are engaging in significant efforts to update national education frameworks and curricula, in order to better prepare young people for entry into the labour market. The updated curricula often support project-based, student-centred learning, with the aim of encouraging development of soft skills such as critical thinking and problem-solving. For example, in Indonesia, a new national curriculum was launched in 2022, which aims to support the development of 'twenty-first-century skills'.[146]

137 Aide et Action, Lao PDR. (2022). Key informant interview.
138 CFC Vietnam. (2022). Key informant interview.

139 UNICEF Cambodia. (2022). Consultation session; UNICEF Lao PDR. (2022). Consultation session.
140 UNDP. (2022). *Digital maturity assessment – Lao PDR: Supporting digital government transformation.*
141 ASEAN. (2022). *Declaration on the digital transformation of education systems in ASEAN; UNICEF Lao PDR. (n.d.). Khang Panya Lao: MoES teaching and learning platform.*
142 UNICEF Cambodia. (2022). Consultation session; UNICEF Lao PDR. (2022). Consultation session.
143 SMERU Research Institute, United Nations Economic and Social Commission for Asia and the Pacific (ESCAP), & Digital Pathways at University of Oxford. (2022). *Accelerating digital skills development in Indonesia: Strategy primer.*
144 UNICEF Indonesia. (2022). Consultation session.
145 UNICEF Cambodia. (2022). Consultation session.
146 UNICEF Indonesia. (2022). Consultation session.

Similarly, in Viet Nam, the education system is shifting from a content-based curriculum to competency-based education, which is set to replace the general national curriculum introduced in 2006.[147]

> " A lot of skills are being taught in the Indonesian school system through memorization, follow the teacher, and there's less of an emphasis on problem-solving, critical thinking, finding your own solution. The MoERT is really trying to eradicate that and have soft skills be more embedded into the curriculum, but previously that was the situation. "
>
> -(Generation Girl employee, Indonesia, key informant interview, November 2022)

Digital literacy is often subsumed under 'twenty-first-century skills' and considered critical to ensuring students are labour-market ready.[148] However, the extent to which countries can include digital literacy in the national curriculum varies depending on issues such as digital access. For example, in Lao PDR, ICT is not yet included in the curriculum as schools suffer from widespread infrastructure and device limitations.[149] Similarly, in Timor-Leste, ICT has only recently been added and key informants highlighted that challenges remain with connectivity and device access.[150] Furthermore, awareness among teachers in Timor-Leste potentially remains low, as data from the online teacher survey show that 52 per cent reported digital literacy was not included in the curriculum.[151]

> " When it comes to both the formal and non-formal education system there is no real incorporation of digital skills into the curriculum … largely because the schools really suffer from textbook shortages and lack of electricity. So, most schools in Laos, I think 0.0001% would have devices in the classroom. So, they're not really at a point of introducing a focus on digital skills development unfortunately. "
>
> -(UNICEF Lao PDR employee, Lao PDR, consultation session, November 2022)

Yet some countries in the region are exploring how to include ICT in the national curriculum despite these challenges. For example, Viet Nam has introduced a national education framework, which provides flexibility at the provincial level to choose the precise ICT curriculum used, depending on the infrastructure and facilities available (see Box 5. 'Spotlight on Viet Nam: The national education framework'). Equally, in Cambodia, ICT is included as part of the 'technical' curriculum and worksheets are used in the absence of digital devices (see Box 3. 'Spotlight on Cambodia: Worksheets'). The Government of Cambodia is also exploring innovation in the ICT curriculum through the New Generation School initiative (see Box 6. 'Spotlight on Cambodia: The New Generation School (NGS) initiative').

Box 5. **Spotlight on Viet Nam: The national education framework**

Viet Nam has introduced a national education framework, which outlines the essential components that must be included in curricula (e.g., 'programming' in ICT). However, provinces are given the autonomy to choose the precise curriculum they use, based on their available resources and facilities at a local level.

Provinces and schools can partner with local education actors (depending on the available budget) to select instructional materials and address challenges with issues such as device access and teacher training. This level of flexibility is valuable in a country as diverse as Viet Nam, where some provinces and urban areas have much larger budgets and greater digital access than those in rural areas. It also gives provinces and schools the opportunity to ensure they are using the most up-to-date ICT curricula and instructional materials.

> " You have the official framework of the curriculum, but because Viet Nam is a big country with high variation and differences between schools across provinces, lots of space is left for schools to choose from, depending on infrastructure, facilities available, etc. "
>
> - (CFC Vietnam employee, Viet Nam, key informant interview, November 2022)

> " They have to follow the framework, but they can choose different textbooks; for example they have to do programming, but they can choose Scratch, or a different one, based on their approach or their partners. The education companies that work in provinces to provide the services to the schools – they provide curriculum, they provide the tools, the facilities, the training for teachers, etc. "
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> - (Vietnet-ICT employee, Viet Nam, key informant interview, November 2022)

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147 ECE Connection. (2020, January 16). New general education curriculum to be implemented (Vietnam).

148 UNESCO. (2018). *Digital skills critical for jobs and social inclusion.*

149 UNICEF Lao PDR. (2022). Consultation session.

150 MoEYS, Timor-Leste. (2022). Key informant interview.

151 Note: The online teacher survey data for Timor-Leste cannot be considered representative.

> **Box 6. Spotlight on Cambodia: The New Generation School (NGS) initiative**
>
> The NGS initiative, launched by the Government of Cambodia in 2015, aims to improve the quality of education by raising teaching standards; improving student performance; innovating curriculum; and introducing accountability measures. New Generation Schools act as incubators for innovation in education, aiming to move public schools towards achieving 'maximal' standards of education, especially in STEM subjects.[152] Digital access is an important aspect and includes internet connections, classroom projectors, printers and copiers, and teachers' laptops.
>
> However, these schools and their students differ markedly from those in the broader public school system. They are located in urban areas and receive funding from public and private sources, including student fees of approximately $250 a year. Student selection is also highly competitive and based on academic performance. Thus, the children who attend these schools tend to come from higher-income backgrounds and perform well academically even pre-admission.[153]

The extent to which digital literacy is taught as a specialized subject (ICT), or is integrated as competences across multiple subjects, varies, in part because of differing digital access in schools. For example, in Cambodia, students are taught ICT as a component of the technical curriculum, which takes place during weekly sessions in secondary school. However, students only have access to school computer labs approximately once a month.[154] In fact, 61 per cent of respondents in the online teacher survey reported that digital literacy was not included in the curriculum at all, and 66 per cent observed that students never had access to computers. Thus, there are limited opportunities for digital literacy development across the curriculum, especially in relation to use of desktop and laptop computers.

By contrast, in Viet Nam, where there is greater digital access, ICT is taught as a compulsory subject from Grade 3 (primary school) and in some cases digital competences are taught across multiple subjects.[155] This access is corroborated by the online teacher survey data, which show that 65 per cent of respondents reported that digital literacy was taught in ICT classes, and 23 per cent said that digital skills were taught in multiple subjects. Additionally, 88 per cent of teachers had daily internet access, and 61 per cent used a computer or tablet to deliver a lesson at least once a month.[156] Some students, primarily those in urban areas where there is greater digital access, can also attend ICT clubs to develop more advanced digital competences, based on a curriculum of the training organization's choice.[157]

> " Other than the official curriculum, many schools have ICT clubs, and this model is very effective. So, the kids in these clubs are very advanced. I've seen some kids even support the teachers, for example on Zoom, on Live Stream. The curriculum for the clubs is very open. "
>
> -(CFC Vietnam employee, Viet Nam, key informant interview, November 2022)

Educators' ability to teach digital competences also plays a significant role, particularly in instances where they are expected to teach them across multiple subjects. Data from the online survey in Viet Nam show that 81 per cent of teachers had training opportunities to improve their own digital skills, and of those, 98 per cent also received training on how to teach digital skills.

By contrast, in Indonesia, a new curriculum was adopted in 2013, which aimed to integrate digital skills across multiple subjects instead of within a specialized, compulsory ICT subject as had occurred historically. This approach was not effectively implemented, however, in part because most training programmes did not equip teachers to integrate digital skills into their lessons.[158] This had the unintended consequence of reducing opportunities for students to learn digital skills at school and limiting the development of their digital literacy.[159]

Dynamic digital literacy education frameworks, curricula and teacher training programmes appear to be becoming increasingly popular among some high-income countries in the region, in response to the rapid pace of technological change. Countries and territories such as Hong Kong, China, the Republic of Korea and Singapore have developed digital literacy education plans that advocate for a continuous update of materials and teaching methods (see Box 8. 'Spotlight on Hong Kong, China: A dynamic teacher training framework').[160] Some other countries in the region, such as Cambodia, also aim to learn from these examples (see Box 7. 'Spotlight on Cambodia: Learning from Republic of Korea and China').

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[152] KAPE. (n.d.). New Generation School (NGS).

[153] MoEYS, Cambodia. (2022). Key informant interview.

[154] MoEYS, Cambodia. (2022). Key informant interview; Sisters of Code, Cambodia. (2022). Key informant interview.

[155] UNESCO. (2019). Digital kids Asia-Pacific: Vietnam country report. The goal is to provide primary students with the building blocks to advance their digital skills over time, starting with problem-solving techniques that include basic coding.

[156] Note: The online survey data for Viet Nam cannot be considered representative.

[157] UNESCO. (2019). Digital kids Asia-Pacific: Insights into children's digital citizenship.

[158] SMERU Research Institute, United Nations Economic and Social Commission for Asia and the Pacific (ESCAP), & Digital Pathways at University of Oxford. (2022). Accelerating digital skills development in Indonesia: Strategy primer.

[159] Ibid.

[160] UNESCO. (2018). Building tomorrow's digital skills: What conclusions can we draw from international comparative indicators?

Box 7. Spotlight on Cambodia: Learning from Republic of Korea and China

The Ministry of Education, Youth and Sport is developing an updated ICT curriculum and teacher training programme, with support from the Republic of Korea and China, in part based on their lessons learned and best practice. The ministry aims for this curriculum to be relevant to people's everyday lives and the future economy, so it is also exploring possible linkages with the private sector. This is a relatively long-term plan and is not expected to be complete until at least 2024.

> " For all public education, we want a curriculum that tries to help students in their daily life and that of the next generation. Before, no one tried to use ICT in teaching, but now they need to do that. And the ICT that we want to see is not just using computers, but ICT that can be used at the office for administration, for business, for private companies, etc." "
>
> - (Ministry of Education, Youth and Sport employee, Cambodia, key informant interview, November 2022)

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Box 8. Spotlight on Hong Kong, China: A dynamic teacher training framework

In recognition of the fast-changing nature of ICT, Hong Kong, China developed an ICT teacher training framework that aims to constantly evolve.[161] Rather than updating a framework at set intervals (e.g., every five years) and then implementing it, Hong Kong, China's framework included both initial training and continual training plans for teachers to ensure their digital literacy and pedagogy remain up-to-date and relevant. The framework includes four dimensions: technical skills in ICT, pedagogical integration, management and supervision of digital technology, and sociocultural awareness. The framework also delineates specific requirements for preschool, primary and secondary teachers.

Gender considerations

Across the focus countries included in this study, there appear to be few mentions of gender considerations in digital literacy education policies, strategies, frameworks or curricula.[162] This may partly be because several of these countries are still in the early stages of formulating their approach to digital literacy education.

Significantly, though, across these countries there was an emphasis on the importance of equity and inclusivity. For example, during a workshop focused on developing the digital education strategy for Cambodia, 'equity and inclusion' was one of the key themes that arose.[163] Similarly, in Lao PDR, key informants working with the Ministry of Education and Sport to develop its ICT strategy highlighted that inclusivity was a key challenge to be addressed and that girls must be considered as part of this.[164]

> " The biggest challenge is inclusivity. The vast majority don't have access to digital learning, so in fact the majority are excluded. There are levels of disadvantage though and the strategy needs to focus on these key challenges. Inclusion of [non-Lao-Thai language groups] is a priority. Also, low-income, people with disabilities, girls – the traditionally disadvantaged. "
>
> - (UNICEF Lao PDR employee, Lao PDR, consultation session, November 2022)

Any approach that prioritizes equity and inclusion needs to take into consideration the gender-specific barriers that girls can experience (e.g., sociocultural norms that position technology as a male domain, gender bias among teachers, and gender-blind approaches to teaching). As these examples from Cambodia and Lao PDR show, digital literacy education appears to be a malleable and shifting space. Thus as countries across the region progress with their digital literacy education planning, there is an important opportunity to ensure girls' specific needs and challenges are acknowledged and addressed through the broader lens of equity and inclusivity.

[161] UNESCO. (2018). Building tomorrow's digital skills: What conclusions can we draw from international comparative indicators?
[162] The focus countries are Cambodia, Indonesia, Lao PDR, Timor-Leste and Viet Nam.
[163] UNICEF Cambodia. (2022). *Cambodia digital education strategy: Summary and workshop notes* [Unpublished].
[164] UNICEF Lao PDR. (2022). Consultation session.

CONCLUSION

This report aimed to provide an initial snapshot of girls' digital literacy across the region. It explored girls' digital access, use and competences; how they develop digital literacy, including enablers and barriers; and how their needs are currently addressed through digital literacy education. It also highlighted innovative programmes, strategies and frameworks that aim to address challenges impeding girls' digital literacy development.

Summary of findings

The study showed that girls and boys across the region are online in huge numbers, but they are often engaging in only a few basic digital activities. Furthermore, despite feeling that digital literacy is important for their future, adolescents often only possess basic digital competences. Lack of progression to more advanced digital competences seems to be particularly acute among girls.

Both girls and boys tend to develop their digital literacy through a combination of self-learning and social learning. The latter often takes place through friends and family and is largely centred around mobile devices. Various factors can act as enablers or barriers to this process. Lack of access to infrastructure, devices and data can pose a barrier to girls and boys across the region, particularly in rural areas. Language issues can also be a challenge, particularly for those unfamiliar with English. Sociocultural norms can also present a barrier, specifically to girls, because stereotypical gender roles can affect girls' confidence, motivation and interest in developing more advanced digital competences. Concerns about girls' online safety can also lead gatekeepers (e.g., parents and caregivers) to impose restrictions on use, thus impeding girls' opportunities to learn.

Governments across the region are engaging in large-scale digital transformation efforts, and digital literacy education is often an integral aspect of this. However, governments have a number of challenges to contend with in order to introduce digital literacy education, including lack of digital access and poor teaching quality in the public school system. Issues around teaching quality are likely to particularly affect girls, as current approaches to teaching digital literacy appear to be largely gender-blind. This gender-blindness could act as a further barrier to girls' digital literacy development, given the sociocultural norms that need to be addressed in order to support girls to progress to more advanced digital competences.

Key issues to address

Girls and boys need additional support to ensure they develop more advanced digital competences and can apply these in labour-market settings. For example, they might need to learn how to assess the authenticity of information online; how to engage in intensive creation and manipulation of content; or how to use platforms commonly found in office environments, such as Zoom and Microsoft Teams. Formal and non-formal education actors could have an important role to play here, by increasing access to the types of digital devices that students may need familiarity with in labour-market settings, such as laptop computers, and by partnering with the private sector to ensure that students develop digital competences relevant to future employment. Approaches aimed at building more advanced digital literacy may also be able to leverage adolescents' general familiarity with social media as a starting point.

The barriers that girls and boys are experiencing also need to be addressed, to ensure they can develop their digital literacy unimpeded. Cross-sectoral collaboration between government, public sector organizations (such as education providers) and private sector organizations (such as mobile network operators) can be valuable in tackling physical access challenges. Adolescents also need digital content and training materials available in the languages most familiar to them. Large-scale, holistic approaches are needed to effectively shift the sociocultural norms that affect girls' digital literacy development. These approaches must target the attitudes, beliefs and behaviours not only of girls but also of their families, their communities and wider society.

A key priority must be to address the lack of digital access within public education systems, particularly in rural areas. As mentioned earlier, cross-sectoral collaboration may be valuable in overcoming this challenge. Where possible, the focus should be on providing access to the types of devices and platforms that students may be required to engage with in the labour market. Improvement of teaching quality is also vital and should include training to enhance teachers' own digital literacy and their knowledge of pedagogical techniques for teaching digital competences. Teachers should also receive training on gender stereotypes in STEM education and how to address them through gender-responsive learning environments.

It is important to acknowledge that owing to gaps in the available data, this study has not been able to fully account for more marginalized groups, such as those with disabilities or who are out of school. Consequently, there may be a range of additional challenges they face that require different, or additional, types of support to those highlighted in this study.
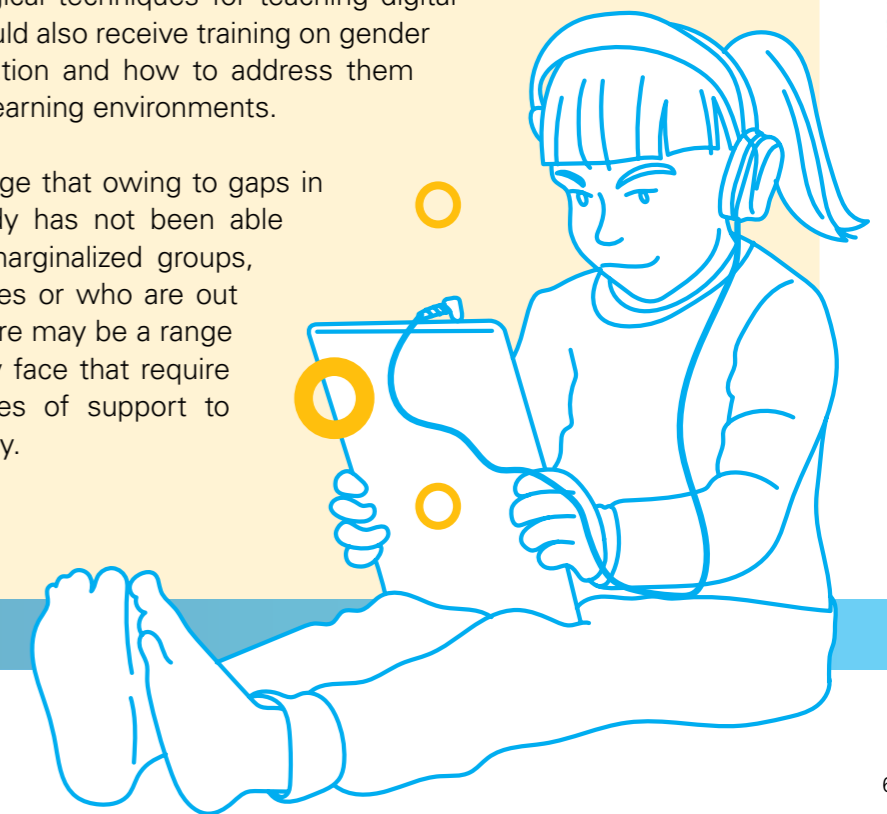
RECOMMENDATIONS

The following recommendations highlight actions that can address the challenges impeding girls' digital literacy development across the region.

1 **Build an evidence base to address data gaps on girls' digital literacy.**

The report findings suggest the following areas need more research:

○ 1.1. **Digital literacy gender gaps among children and adolescents, particularly more marginalized populations:** Large-scale, in-person survey data are needed, preferably with the addition of performance tests to assess digital skills and competences. All data should be sex disaggregated.

○ 1.2. **The impact of interventions designed to bridge digital gender gaps, and their effectiveness in different settings:** A combination of quantitative and qualitative data would be valuable to assess impact and effectiveness.

○ 1.3. **The impact of tablets in the classroom and their effectiveness in supporting digital literacy development:** The existing data largely focus on mobile phones, desktop computers and laptop computers, yet various recent initiatives have been working to expand digital access in education through provision of tablets. A combination of quantitative and qualitative data would be valuable to assess impact and effectiveness.

○ 1.4. **The nature of cognitive bias among teachers in the classroom, and potential gender differences among teachers:** An ethnographic research approach would be suitable, as it is challenging for teachers to self-report on cognitive bias.

○ 1.5. **The extent to which gender is considered in national ICT curricula:** A systematic review of ICT curricula across the region is needed to assess gender considerations. Where possible, curricula should be reviewed in national languages.

2 **Increase access to affordable internet and digital devices, particularly in rural areas.**

Collaboration between government, public sector organizations (such as education providers) and private sector organizations (such as mobile network operators) can be valuable in tackling these challenges. For example, one solution involves 'zero-rating' education platform content, to ensure it is free for teachers and learners to access. UNICEF Lao PDR is currently pursuing this approach with internet service providers in Lao PDR, to make the digital learning platform, Khang Panya Lao, free to use.

3 **Develop instructional materials and digital content in local languages.**

Digital content and training materials need to be made available to adolescents in the languages most familiar to them. These should include at a minimum the national language(s), and where possible also local dialects. Where possible, it should also contextualize with local examples that are relevant to the target population(s).

4 **Address sociocultural norms that limit girls' technology-related aspirations and learning opportunities.**

A combination of approaches is needed to target the attitudes, beliefs and behaviours not only of girls, but also of their families, their communities and wider society. These approaches should include:

○ 4.1. **Teacher training to enhance digital literacy education and address gender barriers:** This must include, first, training to improve teachers' own digital literacy and their knowledge of pedagogical techniques for teaching digital competences. It should then also include training on gender stereotypes in STEM education and how to address them through gender-responsive learning environments (e.g., introduction of project-based learning focused on 'real-world' problems that are relevant to girls).

4.2. **Promotion of girls' participation in digital literacy education:** Once digital access in the school system has been achieved, this promotion can include education frameworks and curricula that introduce ICT as a distinct subject during primary education and maintain it as a compulsory subject during secondary education. Additionally, curricula that promote development of digital competences across multiple subjects are needed, along with gender-sensitive instructional materials that avoid reinforcing gender stereotypes around technology through language or imagery.

4.3. **Public and private sector collaboration to enhance digital literacy education and address gender stereotypes in technology career pathways:** This should firstly include collaboration with the private sector to ensure students develop digital competences relevant to future employment opportunities. Collaboration should also include practical linkages such as women in the technology sector acting as role models and mentors for girls in formal and non-formal education. It could also involve internship and work experience opportunities for girls in the technology sector.

4.4. **Parent and community outreach programmes to address gender stereotypes in technology career pathways:** These would include, for example, programmes that address perceptions that 'technology is a male domain' and highlight how studying ICT could benefit girls, including potential career paths.

4.5. **Parent and community training on how to guide rather than restrict girls' digital activity:** This should include training to improve parents' own digital literacy and their understanding that the use of digital devices and the internet can be beneficial to girls (with clear examples of the benefits). It should also focus on building parent confidence and knowledge about how they can support girls to stay safe online.

4.6. **Extracurricular and non-formal digital literacy education opportunities:** These should include local community programmes for girls who are out of school, or for those who desire additional support and learning opportunities. These programmes should focus on creating gender-responsive learning

environments that are particularly sensitive to the needs of girls with low digital literacy. They should also leverage local networks already connected with marginalized girls (e.g., youth groups and women's groups) and engage with these networks to understand the specific needs of the girls they work with.

4.7. **Media campaigns that address gender stereotypes in technology and concerns about online safety:** These should target girls, parents and caregivers, and their communities. Girls and parents should be involved in campaign development to ensure relevance of content. Calls to action should drive girls, parents and caregivers to participate in the training and outreach programmes recommended above.

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