THE WORLD WE WANT

Cambodian Youth Perspectives

Edited by

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Chapter 5 | Digital Citizenship and Education

Sokunthea HANG and Pagna UKTHAUN

Future Scenario

Sitting in his hotel room during his vacation in Hawaii, Bora joins his boss in Cambodia for a virtual meeting with their clients in South Korea. Bora explains the new product features to his clients in English and their feedback translates automatically in his notepad and sends instantly to his boss Mr. Panha in Khmer. The client is impressed with the communication and new services. They also appreciate that Bora was able to schedule the meeting during the Khmer New Year holidays.

After the meeting, Mr. Panha is quite optimistic that they will get this new client to sign the contract. He's always impressed with Bora who, despite graduating from a local university in Cambodia, always efficiently handles all kinds of matters, be it face-to-face communication with clients and other colleagues, or helping Mr. Panha to manage his digital communication and foreign languages in business. This is the great advantage of the younger generation who completed their standard education after the government introduced a new policy to improve digital life skills for citizens nation-wide based on a new curriculum - a luxury Mr. Panha's generation could not have imagined when they were in school.

Bora's achievements are a result of the success of building infrastructure for digital education over 20 years. The ICT baseline curriculum was embedded into the nation-wide education system from primary school to university levels. Bora was a member of the first cohort to enter this curriculum in first grade. This experience transformed his digital skills giving him the opportunity to significantly increase his income level. Because of this, he was able to build a life for himself and provide a better standard of living for his family in his hometown.

The main objective of the new education policy was to improve the quality of digital literacy education for all people in Cambodia in both public and private schools, creating an equal opportunity to compete in the labor market. As a personal assistant to the director of a shipping company, at the age of 25, Bora is considered quite successful compared to his peers. Coming from a rural town in Prey Veng, he knew what it meant to be responsible for his life and utilized all the opportunities in his education to make real change for his family and community as a whole. Motivation pushed him to work hard and smart.

The new policy didn't come without costs. It was difficult for Bora and his peers to manage the changes that differentiate them from previous generations. At the start, he recalled that many of his classmates struggled with the language barrier when courses were delivered in English and needed to hire special tutors to explain the material to them outside school. The new focus on

Project Based Learning was also very challenging and as a result, many failed the pilot programs prior to his time. For someone of his socio-economic background it was impossible to hire tutors, but he was able to solve many of the problems with support from free online resources in subjects ranging from English to communication content creation, as well as short courses on data privacy which helped serve as secondary resources on top of classroom learning.

Bora knows if this program could work for him, it can work for his future children too. There's no need to consider the option to choose an overseas education for them even if he can afford such an opportunity.

Introduction

Innovation, ICT, Science, Technology, Engineering and Mathematics (STEM) and skills development of the youth are widely regarded as areas that need to be improved to promote economic growth and development in Cambodia (Ministry of Education, Youth and Sport (MoEYS), 2018; Asian Development Bank (ADB), 2021). Factors that will support these changes are a growing middle class who are young, tech-savvy and passionate about creating social change, a high smartphone penetration rate and cheap data and one of the most open markets, in terms of Foreign Direct Investment, in the ASEAN region (DataReportal, 2021).

This chapter examines whether Cambodian youth are fully utilizing the digital tools available to them to improve their digital literacy skills to prepare them for 21st-century economic competition in the country as well as the region. This paper will propose a policy to introduce 'Digital Life Skills' into the national educational curriculum on Digital Citizenship in order to address the current limitations in preparing youth for digital readiness by 2040. The Digital Life Skills should include the know-how of digital basics including but not limited to information and data literacy, communication and collaboration, and safety.

Context Analysis

In this paper we examine digital citizenship in the context of digital literacy education by reviewing the Cambodian government's "Rectangular Strategy phase IV" and the ICT in Education policy which set the framework for transforming Cambodia into an upper-middle income country by 2050 through economic digitalization. Digital Citizenship refers to the ability to participate in society online which encourages a certain degree of social inclusion (Warschauer, 2003). Digital citizens then, are defined as those who use the Internet regularly and effectively (Mossberger et al., 2008).

Rectangular Strategy and ICT in Education

Both international institutions and the Cambodian government are largely aware of the significance in promoting technological innovation and entrepreneurship (UNDP, 2020a; MoEYS, 2018). Hence, numerous resources have been invested from both public and private sources to help advance growth in these sectors in the past five years, in line with the digital literacy framework.

In 2018, the Cambodian government issued the Rectangular Strategy phase IV which sets out a roadmap to make Cambodia an upper-middle income country by 2050. The Strategy builds on four strategic areas including human resource development, economic diversification, promotion of private sector development and employment, and inclusive and sustainable development (Royal Government of Cambodia, 2018).

The Royal Government of Cambodia (RGC) hopes to achieve the objectives of the Rectangular Strategy by taking full advantage of regional opportunities, creating value added in existing economic pillars and their related sub-sectors, encouraging investment in agriculture, ensuring readiness to grab new technologies in the era of digital economy and overcome foreseeable challenges in the context of industrial revolution 4.0 ("Promoting Agriculture", 2019; ADB, 2021).

Current digital literacy issues and limitations

In order to understand the current digital literacy landscape and its limitations, UNDP published the Cambodia Digital Literacy Assessment Report in September 2020 which surveyed 1,285 individuals consisting mainly of high school students, followed by undergraduate students, and youth in employment across the country (UNDP, 2020b). The study was based on the UNESCO framework for digital literacy which looks at competence areas such as information and data literacy, communication and collaboration, digital content creation, safety and problem solving.

According to the study, Cambodian youth achieved low digital literacy scores of between 47 to 51 points in all four competence areas (UNDP, 2020b, p.44). The report suggested that youth should receive an average overall score of 75 or higher with no areas lower than 65 to be considered digitally competent in a globalized and connected economy. This means that Cambodian youth did not reach a level of digital competence. The data also shows those who have received higher education perform consistently better compared to those at lower levels of education.

It is important to note that the area of Safety received the lowest scores among the four test areas (UNDP, 2020b, p.44). This indicates the lack of ability for youth to safeguard themselves. Safety includes questions of cyber security, such as protection toward scams, phishing, or security breaches. The youth however performed better in the content creation and information literacy areas. This is in line with another question which asked how youth use digital devices in their daily life where most young people answered media consumption and social networking (UNDP, 2020b, p.38). Using smartphones for reading news and for photography are the third and fourth most used functions within all three surveyed youth groups.

The results from the study shed light on the gap between current digital literacy skills among youth and the RGC's goal of achieving a digital economy and industry 4.0 by 2050. One of the key components related to human resource development in the Rectangular Strategy is a focus on

improving the quality of education, science and technology (Royal Government of Cambodia, 2018). The strategy aims to change the current digital literacy landscape among Cambodian youth, but so far little has been done. High schoolers in grade 11 and 12 are currently the only students receiving an ICT curriculum in their school program and it covers only computer hardware and basic lessons for Microsoft applications (UNDP, 2020b). The existing curriculum is not able to educate youth to keep up with the fast pace of technological advancement, especially when the world is preparing to take full advantage of the Industrial Revolution 4.0 (UNDP, 2020a).

In the same year as the Rectangular Strategy was launched, the Ministry of Education, Youth and Sports (MOEYS) also launched the Policy and Strategy on Information and Communication Technology (ICT) in Cambodia which aims to: equip students with ICT knowledge and skills, increase ICT tools and e-resources for teachers and training centers, improve infrastructure and connectivity, as well as promote media literacy and privacy (MoEYS, 2018). This policy was integrated into the 5 year Education Strategic Plan in 2019 on Promotion of Digital Education (MoEYS, 2019). Much of the content from the strategic plan offers open-ended goals, which have not provided a methodology for the clear execution of its aims. This makes it difficult to track progress on whether or not the policy statements will be achieved.

In addition, the Ministry of Post and Telecommunications (MPTC) is currently working together with the Ministry of Education, Youth and Sport to build a digital infrastructure and training program for high school and junior high school students to prepare them for future employment and the economic development of the country (Dara, 2020). However, with limited digital infrastructure, equipment and connectivity in place in existing public schools, the cost of investment and short timeframe will be a huge challenge for the government to tackle. On top of that, almost all existing software, programs and applications are all in English and other foreign languages while Cambodia ranked 84th in the world English Proficiency Index (EF Education First, 2020). This means that the policies the Cambodian government has in place as well as the Education Ministry's strategy to improve digital literacy and innovation skills are unlikely to be met by the existing resources in place in Cambodia to implement those plans.

Policy Recommendations

The current weakness in digital literacy among youth is one of the results of the late transformation in Cambodia's educational system to increase talent digital competitiveness compared to countries in the region (Kusumastuti and Nuryani, 2020). Although many initiatives and programs outside of the school curriculum are being introduced to increase digital skills and knowledge to youth in higher education, much still needs to be done at the primary and secondary levels to give students a solid foundation as they progress in society and the workforce.

To ensure the future workforce is equipped with digital life skills to navigate the technological era, it is important that the educational system is not just offering foundational learning, but also exploration and project-based learning. To achieve a combined approach, the government should embed the design process and technique into policy development and recommendations to drive transformational changes that respond to the needs of the young workforce.

Design techniques have successfully helped governments to improve public service delivery to meet citizens' needs and respond to the fast changing environment, such as the influence of technology on people's lives. In 2019, McKinsey released a report on how Singapore is transforming government services with an innovation and design team to help civil servants and policy makers make changes in public service delivery (Vidhya et al., 2019). There are three core elements that Singapore deployed in this process: 1) consolidating services around the important moments of a citizen's life, 2) using immersive research to co-create solutions with a user, and 3) prototyping solutions in real life scenarios to ensure successful user adoption.

Looking at how Singapore harnesses design, it is clear that MPTC and MOEYS should integrate design elements to help unlock key development areas to equip Cambodian youth with digital skills. Accelerating ICT skills and knowledge for students where a digital foundation was not provided in early school programs will require a transformational approach to leapfrog the traditional process. This means that redesigning school curricula and infrastructure will need to go hand in hand and work to complement one another through a well-designed process. For example, using prototype techniques will help schools to experiment with the actual level of student needs in terms of ICT equipment and connectivity levels required for each subject that the program offers.

Consolidating educational experiences around important moments of students' development

While the ICT curriculum is being introduced slowly, the new program needs to make a significant change. Starting from primary education until high school, ICT should be offered as a core subject along with math, science, Khmer literature and languages. The ICT standard for public schools should offer a baseline for every school to adopt and ensure that students will achieve a minimum standard of digital skills and literacy for society and industry. The ICT baseline allows school programs to set expected targets for each educational milestone, such as primary, lower secondary and upper secondary education. A number of minimum ICT subjects from primary to upper secondary level should be embedded into core curriculum along with external factors such as technological changing environment and industry's digital skills need. Table 1 below is an example of how a school program can include digital life skills for upper secondary education from grade 9th to 12th to prepare students for a better navigation in the digital world and safely apply into their daily lives. Digital safety skills, which are now low, should be a foundation upon which more digital learning occurs.

The new ICT curriculum should be designed around the growing need for students to be familiar with the technological world and safely navigate within it with minimal risk. For example, Common Sense Education, an independent nonprofit organization, offers a digital citizen program to help teachers and partners prepare their children to safely enjoy digital tools and live safely in the digital world. The curriculum offers a variety of topics such as Media Balance and Well-Being, Privacy and Security, Digital Footprint and Identity, Relationships and Communication, Cyberbullying, Digital Drama and Hate Speech, and News and Media Literacy. Students are not just learning to use the digital application tools and software at school but are also able to obtain digital life skills on topics they encounter in their day to day life and are therefore able to navigate challenges when they arise.

Table 1: Sample Curriculum of Digital Citizenship Program

Level	Topic	Description
Grade 9th	The Big Data Dilemma	What are the benefits and drawbacks of online tracking? Helping students to understand how they are being tracked online and how much information are companies actually collecting and what are they doing with it. Digging into the details can help us make smart decisions about our online privacy and how to protect it.
Grade 10th	Risk Check for New Tech	What privacy risks do new technologies present, and how do we decide if they're worth it? New tech, like location services and smart devices, helps make our lives easier and opens opportunities that didn't exist before. But these innovations also come with a cost, especially to our privacy. Help students consider the benefits and drawbacks of these new technologies and decide whether they're ultimately worth it.
Grade 11th	How young is too young for social media?	At what age should people be allowed to use social media? Understanding at what age people should be

		allowed to use social media. Social media platforms allow people to connect with peers and have fun, but they are also susceptible to a number of risks from privacy to bullying to challenges to user social-emotional well-being.
Grade 12th	Debating the Privacy Line	Should the government have access to all your social media and cell phone data? More data and information often help to make better decisions. The power of data can benefit both individuals, institutions and governments, but who can be trusted and responsible for having all of the data? Can the government collect and use it fairly without violating people's privacy? This lesson helps students think through this question and become thoughtful influencers of data policy and practice.

Adapted from: Common Sense Education, 2020.

Furthermore, since digital skills and literacy require real life examples to be fully understood, the school program should include project-based learning (PBL). PBL helps students to learn by exploration through collaborative problem solving in a group setting. PBL allows students to resolve problems by engaging with real issues, develop critical thinking and encourages collaboration with an attitude of learning by doing and achieving together. The PBL approach was introduced in the early 1980s to promote a student centric learning environment where students are working toward a specific design project or theme and teachers act as mentors to give instruction and feedback throughout the process (Du and Han, 2016).

Liger Leadership Academy in Cambodia is one of a new generation of schools that cultivates project-based learning to build a generation of future leaders with technological skills and equipped with necessary soft skills such as working together toward common goals and protecting one another. Liger's PBL model aims to create a group of entrepreneurial thinkers who are able to think critically on complex issues, solve real world problems and make effective decisions (Liger Leadership Academy, 2019).

Adopting project-based learning and startup acceleration approaches to allow students to co-create meaningful solutions together

Korkmaz and Kaptan have identified six steps for implementing PBL (Korkmaz and Kaptan, 2000 in Du and Han, 2016). First, students form a group and select a subject, an issue or a theme that they want to address and resolve. Second, the group members are assigned roles and make a project plan where they set key objectives such as what they want to learn and what outputs they need to deliver. Third, the group works to collect data and information through various applications and resources that are available to them. This fact checking is an important milestone to help them verify their problem statement and to offer a valid solution in the presentation of findings at step four (planning of the presentation) and five (making the presentation) respectively. Finally, students will receive and share feedback from team members and other groups along with the teacher's evaluation.

A project-based approach can also apply to the startup technology acceleration model. For example, 500 Startups, a venture capital firm that invests in companies and entrepreneurs who are selected to join their acceleration program, offers six areas of main support, two of which are community and advice. The program creates a community of like-minded people who can work together and share the same challenges.

Similarly, UNDP Cambodia launched a technology incubation program in 2020, called Bluetribe, which recruited individuals and teams with promising ideas and skill sets to work together to form a technology venture that resolved societal and industry challenges or met gaps. Cohorts receive the same amount of financial support along with a business and technology acceleration curriculum, and mentorship hours. Cohorts are expected to form a team, build a venture and create a minimum viable product that fits with user needs and wants in 36 weeks.

Prototyping school infrastructure

With the COVID-19 pandemic, school closure is one of the major issues that the government needs to address. In Cambodia alone, more than three million students were affected; just 30 percent of whom have access to ICT devices such as smartphones or computers (Som, 2020). There is little digital infrastructure and connectivity in place to help students and teachers to continue their learning. Furthermore, a huge inequality gap is growing with more than 390,000 people in Cambodia left unemployed due to the economic fallout of COVID-19 (ADB, 2020). Among these people are parents who cannot even afford to phone data where their children could watch educational videos broadcast through social media channels (Chansereypich and Darby, 2020).

Looking deeper at the current school infrastructure, public schools are still not equipped with digital equipment, computer labs and internet connectivity. It is going to be an expensive investment for the government to bring schools up to standard nationwide. On top of that, many schools' physical buildings, furniture and security will need to be renovated and improved should

the above recommendations be implemented. These investments are a few amongst many that the government will need to make within a reasonable time frame if they want to achieve digital transformation in public education. However, the emergence of Industry 4.0 and other forms of technological advancement, leave a very limited time window for Cambodia to catch up. Changes need to happen rapidly to ensure that Cambodia's youth will continue to stay relevant and competitive as human resources compared to their peers in the region and beyond. To ensure these investments in the education system are made efficiently, the new ICT school infrastructure should be divided into three stages: immediate, medium and long term.

The immediate need for schools today is to get connectivity for students. In June 2020 the MOEYS and MOPTC launched the new digital learning centre at Preah Sisowath Highschool but there is no similar centre available in other schools across the country. It is important that the government ensures school connectivity to offer students an uninterrupted learning environment as a basic requirement. Schools should set some budget aside for either installing internet in their classrooms or giving phone credit to teachers that need to deliver lessons through online and digital mediums.

In the medium term, digital life skills should be taught with real life exploration and experiential learning through local innovation and creativity. Klembox, a local startup that offers low cost experiential learning tool kits to public schools, is an example of how local innovation could help to provide low cost experiential lab learning through innovative toolkits. In 2020, through a collaboration with the United Nations Development Programme (UNDP) in Cambodia, Klembox learning toolkits were introduced to four public schools to experiment with the low cost school lab. Lower secondary students in grade 7 and 8 were given the opportunity to gain real life experience through multiple science kits (Ukthaun, 2020). Another local academy, DataU, recently partnered with GIZ to develop a digital talent program in Siem Reap to reduce economic vulnerability and prepare youth for digital employment (DataU, 2020). The program also offers job matching through its career fair initiative and partnership with businesses to gain early access to newly trained digital talents.

In the long-term, it is crucial that there is on-going investment in capacity development for teachers in ICT to ensure the high investment cost in setting up digital infrastructure and connectivity for schools matches the capacity of teachers who guide and teach students. There are already existing examples and case studies on how the government could implement such a long-term investment plan to support teachers' capacity development. InSTEDD, is an innovation lab in Southeast Asia using technology for social innovation and development. InSTEDD has

piloted a Computational Thinking Program with the New Generation Schools[1] in Phnom Penh, Kandal and Kompong Cham provinces in Cambodia to improve teachers' knowledge in ICT in order to take full advantage of computer labs that have been set up (InSTEDD, 2019). Computational Thinking offers a new way of teaching in the digital era by focusing on solving complex problems by fully participating in a computational world where students can collect data, create algorithms and computational models, and understand the systems to learn topics in many disciplines (Digital Promise, 2021).

Table 2 below shows an extract of the Computational Thinking Program delivered by UNDP in partnership with InSTEDD. This capacity development program for teachers aimed to support the Royal Government of Cambodia in accelerating digital learning at public schools. The program was piloted in 2020 with selected teachers from ten public schools across Cambodia and delivered via online engagement due to the COVID-19 pandemic. In 2021, UNDP is organizing another cycle of training to ensure more and more teachers are equipped with digital knowledge and skills for enabling a digital learning environment for Cambodian children and youth.

Table 2: Sample curriculum of Computational Thinking Program based on CODE.ORG

Grade	Chapter	Teaching Class Hour	Teacher Training Hour
Grade 7	Unit 1: Computer science fundamental – Express Courses *Students will learn to create computer programs, develop problem-solving skills, and work through fun challenges!* Unit 2: Introduction and Create Account - Introduction to Learning Management System (Teacher's Dashboard) - Introduction - Direct teachers to go to each lesson Lesson 1: Graph Paper Programming Lesson 2: Coding with Angry Birds Lesson 3: Debugging with Scrat Lesson 4: Creating Art with Code	32	32

[1] Part of the public education reform policy published in 2016, the New Generation Schools initiative will see the creation of autonomous public schools which receive high investment linked to new standards of accountability and governance as well as professional standards for 21st century learning.

	Lesson 5: Getting Loppy Lesson 6: Loops with Rey and BB-8 Lesson 7: While Loops with the Farmer Lesson 8: Until Loops in Maze Lesson 9: If/Else with Bee Lesson 10: Function with the Harvester Lesson 11: Changing Variables with Bee Lesson 12: For Loops with Bee Lesson 13: Binary Images with Artists		
Grade 8	**Unit 1 - Problem Solving** *Students will learn how computers input, output, store, and process information to help humans solve problems within the context of apps. The unit concludes with students designing an app that helps solve a problem of their choosing.* Lesson 1: Intro to Problem Solving Lesson 2: The Problem Solving Process Lesson 3: Exploring Problem Solving Lesson 4: What is a Computer? Lesson 5: Input and Output Lesson 6: Processing Lesson 7: Apps and Storage Lesson 8: Project - Propose an App **Unit 2 - Web Development** *Students are empowered to create and share the content on their own web pages. They begin by thinking about the role of the web, and how it can be used as a medium for creative expression.* Lesson 1: Exploring Websites Lesson 2: Websites for Expression Lesson 3: Intro to HTML Lesson 4: Headings Lesson 5: Digital Footprint	18 16	23 14

Adapted from: InSTEDD, 2019.

Furthermore, a joint investment with private sectors to ensure Cambodia's human capital development is produced at the highest quality to serve both public and private sector needs should be implemented in the government policy agenda. There are growing local solutions where the private sector can play an important role to support the government in closing the gap and needs in this digital education era. Tesdopi, a local startup that provides competency-based learning through its mobile apps, offers an innovative learning method to allow students to take preparation tests, learning and monitoring their learning results based on the national school curriculum. This is an example of how the government should partner with innovators and entrepreneurs to offer innovative approaches to learning to complement the overall strategy and effort to digitize public education in Cambodia.

Conclusion

Low digital literacy among Cambodian youth shows an urgent need for educational reform toward a more digital and practical oriented curriculum to ensure that young people are not left behind in the current technological era. The current public education system in Cambodia offers a limited ICT curriculum that is only available for upper secondary programs. The ICT curriculum is a key solution to accelerate and prepare youth with digital life skills. However, a well-designed curriculum comprising essential skills and opportunities for exploration is also necessary and should be offered in parallel to ICT skills to ensure youth have a solid foundation in both digital applications and practice in real life scenarios.

Under the leadership of MOEYS, a clear ICT baseline curriculum should be established to offer a minimum standard requirement for schools from primary to lower secondary and upper secondary levels. This baseline will provide a foundation for content updates and adjustment according to technological advancement and emerging needs for young people to prepare themselves to lead a safe and successful life now and in the future. Once the ICT curriculum is designed and offered to students, the government should look at the short, medium and long term investments to design ICT infrastructure suitable for the education system. This strategy will reduce the barrier of high investment costs needed to boost infrastructure and connectivity and help to generate local innovative solutions.

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