What are the next Steps in EdTech for

Ho Chi Minh City

Insights from the EdTech Readiness Index

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DEPARTMENT OF EDUCATION AND TRAINING OF HO CHI MINH CITY.

EdTech Readiness Index

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EXECUTIVE SUMMARY

I. EXECUTIVE SUMMARY

This report seeks to analyze Ho Chi Minh City's (HCMC) EdTech policies and practices to better understand the status of digital education programs and define the next steps in EdTech for Ho Chi Minh City. This report is part of a larger effort led by the World Bank through the EdTech Readiness Index (ETRI), an instrument that analyzes the quality of formal policies and the effective implementation of practices within the education systems. The report addresses the following key questions:

1. What is the status of HCMC's EdTech strategy implementation in terms of school management, teachers, students, devices, connectivity, and digital resources?
2. How EdTech practices in HCMC's schools compare with de facto policies?
3. What are the implications in EdTech policies and practices for HCMC's education system?

To address these key questions, data was collected between August and September 2022 remotely by phone using a school survey for information relating to practices and de facto policy implementation at the school level and a policy survey for information relating to the de jure existence of policies[1]. For the school survey, 258 principals and 302 teachers participated from a representative sample of primary and secondary schools of HCMC. For the policy survey, the information was gathered through a legislative review and follow-up interviews with public officials.

Besides the introductory and methodology sections, this report includes two main sections: the ETRI results and the recommendations for HCMC. Results have been organized by pillar (school management, teachers, students, devices, connectivity, and digital resources), and within each pillar, results are presented both at the practice and policy levels. ETRI results are also presented by location and grade. In the final section, eight actionable recommendations are provided.

Even though a policy framework and a coherent strategy to guide the implementation of EdTech policies are a requirement, additional factors need to be taken in consideration to achieve HCMC's education system goals. Policymakers also need to focus on strengthening teachers' human capacities, increasing access and quality of devices and digital education resources, ensuring meaningful connectivity, and guaranteeing monitoring and evaluation tools are efficiently implemented. A summary of the key recommendations is presented below:

1. EdTech strategy: plan, revise and improve coherence and quality assurance in the EdTech strategy. Instead of adopting a single action or methodology, it is advised to deploy a comprehensive system of regular monitoring strategies and assessment tools. This monitoring strategy will equip policymakers with instruments that inform the education community in real time.

2. Human capacities: place teachers and students at the center of the EdTech strategy by building capacities, providing guidance, and support. The ETRI results indicate the

[1] *De facto, (Latin: "from the fact") a legal concept used to refer to what happens in reality or in practice even if not legally recognized, as opposed to de jure ("from the law"), which refers to what is actually notated in legal code, describing practices that are legally recognized, regardless of whether the practice exists in reality.*

importance of planning remedial and supportive mechanisms to guide the role of teachers in both pre-service and in-service environments to use technology in teaching. These support mechanisms are important to strengthen teachers' ability to integrate technology into their pedagogical practices.

3. Devices: include and prioritize the acquisition, distribution, and effective use of digital devices in the schools. Identifying the right devices to be acquired and distributed to schools is an element that aims at enhancing learning in a specific context and it should be guided by a clear and precise vision of bettering education's quality, accessibility, equity, and relevance.

4. Digital education resources (DER): traditional platforms and software programs are widely used, but collaborative software and specific platforms to enhance learning are rarely used. Strategies, guidance, and standards are needed to improve access and quality of digital resources. Also, DERs should be aligned with the national curriculum, the local context, and students with disabilities.

5. Connectivity: connectivity can be considered as an opportunity if the quality and stability are secured. HCMC's education system requires strengthening the strategy to provide high-quality connectivity to all schools, as well as a strong support system to mitigate problems with connectivity such as issues related to stability and low bandwidth.

6. Consistency: assign special attention to the earlier grades of education. EdTech can be a valuable tool for earlier grades when it follows a research-backed pedagogy and engages students with play-based learning activities. When planning strategies to support EdTech such as technical support and guidance for HCMC's schools, the earlier years of education will need special attention to ensure better coherence and consistency across all grades.

7. Management: build on the existing strengths of school management to support the planning, implementation, and monitoring of HCMC's EdTech policies and practices. School management could support the existing and future EdTech strategies.

8. Inequalities: keep working toward bridging the urban and rural divide. Though minor differences are documented when comparing EdTech policies and practices between urban and rural/periurban areas, the few differences across location may be because HCMC's population is highly concentrated in urban areas. Special attention needs to be given to communicating HCMC's EdTech strategy for connectivity, digital resources, and training in rural and peri-urban schools.

I INTRODUCTION

II. INTRODUCTION

The past years have proven challenging for education due to the COVID-19 pandemic but provided an opportunity to build back better education systems. School closures led to an unprecedented global experiment in the acquisition and distribution of digital technologies to deliver remote learning. Countries are now shifting from a 'short-term surge' of EdTech to a 'long-term transformation' of education systems as countries seize the opportunity provided by the crisis to build back better EdTech strategies. Global investment in digital technologies for education is expected to maintain momentum during 2023, as governments, employers and consumers together will spend over $300 billion on hardware, software, and services for education (HolonIQ, 2023).

Vietnam's priorities in the EdTech field have evolved over time from a focus on infrastructure to strengthening school management and digital transformation. From 2000 – 2005, the education system was just at a starting phase of applying IT and the priority was to introduce the concept of information technology (IT) and digital infrastructure to Vietnam's agenda. From 2006 – 2010, the priority shifted to renovating education management through software management systems. From 2011 – 2016, the policy rhetoric emphasized the importance of applying IT in the management of teaching and learning, training activities, and provision of e-learning resources. From 2017 – 2019, the priority across all public state agencies was to strengthen IT applications in reforming administrative management. Since 2020, digital transformation emerges as one of the most significant agendas of the Government with the release of the National Digital Transformation Program for 2025, in which education is set as one of eight prioritized sectors.

The concept of IT and investments in EdTech are not new for Vietnam, they have developed progressively in the policy agenda. The notion of applying IT in education and training in the country started to emerge strongly in the 2000s with the issuance of Directive No. 58/2000, which promoted IT application to serve the cause of industrialization and modernization of Vietnam[2]. In 2006, the Ministry of Education and Training (MOET) started the Support to the Renovation of Education Management (SREM) project to renovate education management and two softwares were created, the educational management information software (EMIS) and the school management software (VEMIS). Even though policy documents during this period emphasized the importance of applying IT in the processes of teaching and learning, implementation was fragmented and not systematically guided.

The year 2017 marked a turning point in the process of strengthening the application of IT for education, especially in reforming administrative management through the project Decision 117/2017. Series of guidelines were issued stipulating the application of IT in training and enrichment activities via the Internet for teachers, education managers, and staff; promulgating statistical indicator system and statistical reporting for education sector; regulations on management, operation and use of the sector database system for preschool, general and continuing education. Provinces embarked more rigorously on implementing online public services, using digital platforms for administrative workflows, provision

[2] *Link to the Directive 58/2000: https://thuvienphapluat.vn/van-ban/Cong-nghe-thong-tin/Chi-thi-58-CT-TW-day-manh-ung-dung-phat-trien-CNTT-phuc-vu-su-nghiep-CNH-HDH-8207.aspx*

of data through EMIS, conducting online meetings and blended training programs for teachers and education managers, and developing e-learning resources. Even with these efforts, the adoption of online teaching and learning in public schools in Vietnam was still limited. Teaching and learning were mostly delivered face-to-face at schools and online platforms were rarely used. Thus, when COVID-19 hit and schools closed, Vietnam's education system faced challenges to implement an effective remote education response.

During the pandemic, the MOET developed plans and provided guidelines to strengthen the application of IT in education and training. The MOET issued Circular 09/2021/TT-BGDĐT promulgating regulations on the management and organization of online teaching for general education and continuing education. The Circular introduces and defines two modes of online teaching including "online teaching to support face-to-face teaching" and "online teaching to replace face-to-face teaching" applied to schools in Vietnam. In 2022, a plan was developed to strengthen the application of *information technology and digital transformation in education* and training. This plan targets six areas: (i) develop and refine institutional mechanisms and policies, (ii) strengthen enabling conditions to implement IT and digital transformation in the MOET, (iii) develop an ecosystem of digital transformation in teaching, learning, testing, assessment, and scientific research, (iv) implement systematically the education management information system- EMIS, (v) communicate, popularize and develop human resources to implement digital transformation in education, and (vi) management and monitoring.

The MOET and provinces also implemented strategies to ensure learning continuity during school closures due to COVID-19. Step-by-step measures were applied under the constraints of available technology infrastructure and tools that the nation and the locals could accommodate. At the central level, as reported in a study conducted by UNICEF and UNESCO,[3] the MOET put in place opportunities for distance learning, online first and later TV when many students could not access online programs due to the lack of digital devices and Internet connection. The MOET mobilized teachers across the country to devise and film TV lessons and developed a database of 2,000-plus videos. One of the main emerging obstacles of online learning during the pandemic in Vietnam was students from disadvantaged areas and poor families lacking internet connection and digital devices. The campaign *"Internet connection and computers for students"* aimed that 100 percent of schools, teachers, pupils, and students will be fully equipped with infrastructure, platforms, computers, and other facilities for online teaching and learning to promote a digital society. As of mid-May 2022, the campaign allocated and handed over 92,629 computers to 21 provinces.

After the challenges experienced to implement a remote education program during the pandemic, the HCMC Department of Education and Training (DOET) aimed to strengthen the digital transformation of the education sector. The DOET requested technical guidance from the World Bank to support DOET in implementing the digital transformation plan, guidance that started with a digital learning assessment to better understand HCMC's current status of digital education programs. The World Bank's EdTech Readiness Index (ETRI), a tool to inform countries of where they stand on EdTech, matched the requirements of HCMC DOET to understand the actual problems as results could be presented in a short timeframe, and because other countries are using the tools, HCMC could compare results to similar peers. The ETRI goes beyond collecting data relating to the availability of devices and the level of connectivity – *the typical first-order infrastructure-related indicators most commonly considered around the world* – to better capture the key elements of the larger 'ecosystems' within the education and technology sectors in a given country whose development are considered critical if investments in 'EdTech' are likely to bear fruit.

[3] *UNICEF and UNESCO (2021). Vietnam case study: Situation Analysis of the Effect of and Response to COVID-19 in Asia. Retrieved from https://www.unicef.org/eap/reports/viet-nam-case-study*

III METHODOLOGY

III. METHODOLOGY

The ETRI is a World Bank instrument that analyzes the quality of formal policies and the effective implementation of practices within the education system. The concept and design of ETRI follow the principles from the (Global Education Policy Dashboard) (GEPD), which in turn uses the overall framework from the (Systems Approach for Better Education Results) (SABER). As stated by SABER, high-quality implementation of poorly designed policies is not likely to improve student learning, and the most well-designed policy and institutional framework will not succeed in improving learning outcomes unless it is implemented effectively down to the school level (The World Bank, 2013). The ETRI provides a systemic view required to plan effective policies by offering a snapshot of how well EdTech is integrated into the broader education system.

The ETRI analyzes both policies and practices under six pillars: school management, teachers, students, devices, connectivity, and digital resources. In HCMC, data were collected using a school survey for information relating to practices and de facto policy implementation at the school level, and a policy survey for information relating to the de jure existence of policies. The school survey was implemented between August and September 2022 remotely (by phone) and 258 principals and 302 teachers from a representative sample of primary and secondary schools in urban and rural/peri-urban areas of HCMC were interviewed. For the policy survey, the information was gathered through a legislative review and follow-up interviews with select public officials. The implementation of this instrument and the analysis of the data is the result of a close collaboration between the HCMC DOET and the World Bank.

IV RESULTS PRESENTATION

IV. RESULTS PRESENTATION

IV.I. ETRI RESULTS BY PILLAR

Results are presented by pillar (school management, teachers, students, devices, connectivity, and digital education resources); within each pillar, practices, and policies are analyzed. The practices include the activities and conditions associated with the use of digital technologies in the schools, considering basic inputs and infrastructure – *devices, connectivity, and digital education resources* – and the conditions to support and foster the integration of ICT in teaching and learning associated to the school management team, teachers, and students. The policies include how the system defines, articulates, and implements strategies to foster desired practices (See graph 1: ETRI 6 Pillars to Understand the System).

Graph 1: ETRI 6 Pillars to Understand the System

SCHOOL MANAGEMENT	TEACHERS	STUDENTS	DEVICES	CONNECTIVITY	DIGITAL EDUCATION RESOURCES
PRACTICE					
STRATEGY	SELF-EFFICACY	SELF-EFFICACY	STUDENT ACCESS	AVAILABILITY	ACCESS
LEADERSHIP	USE - PLANNING	USE - INSIDE	STUDENT USE	STUDENT ACCESS	USE
PRIORITIZATION	USE - TEACHING	USE - OUTSIDE	TECH SUPPORT	QUALITY	QUALITY
POLICY					
RESPONSIBILITY	STANDARDS	FRAMEWORK	STANDARDS	PLAN	GUIDANCE
GUIDANCE	SUPPORT	CURRICULUM	MONITORING	MONITORING	STRATEGY
SUPPORT	EVALUATION	ASSESSMENT	RESPONSIBILITY	SUPPORT SYSTEM	STANDARDS

1. SCHOOL MANAGEMENT

1.1 WHAT DOES SCHOOL MANAGEMENT MEASURES AND WHY DOES IT MATTER?

This pillar assesses the readiness of the school management to use and promote the use of ICT in education. The indicator tracks three aspects at the practice level: (i) the existence of an ICT strategy, (ii) the presence of leadership practices to ensure a broader set of stakeholders are part of the ICT strategy, and (iii) the prioritization of ICT as it relates to student outcomes. It is critical to monitor these aspects because the evidence points out that the integration of ICT in the school's vision and strategic plans have been recognized as one of the key conditions that facilitate the implementation and sustainability of ICT-based innovations in schools. Also, there is consensus that principals' e-leadership, which refers to leadership approaches and practices that aim to realize the vision and goals for e-learning (Chen, Ho, & Ng, 2013), has a positive effect on the use and integration of digital technologies in teaching and learning (Wu, Yu, & Hu, 2019). In this regard, studies have shown that in schools with clear and consistent e-leadership based on the provision of stronger levels of technology support, teachers are more prepared to integrate the use of ICT in their teaching activities (Olszewski & Crompton, 2020).

At the policy level, the school management pillar also tracks three aspects: (i) the responsibility assigned for the integration of the use of ICT if there is an ICT strategy, (ii) the presence of guidance for incorporating ICT into teaching and learning, and (iii) the support through training. These aspects are aligned with the literature that points out that the roles and responsibilities of the school management team are to define the role of ICT in the schools' strategic plans and to implement strategies for the organization wide integration and effective use of digital technologies in respect of its teaching/learning mission and activities (Wu, et al., 2019).

1.2 WHAT ARE THE RESULTS OF THE SCHOOL MANAGEMENT PILLAR IN HCMC?

The school management of EdTech practices and policies in HCMC is the strongest pillar. At the practice level, all school principals report that their schools have a digital strategy, they involve and support teachers to innovate with new ways of teaching with ICT, and prioritize access and usage of digital resources among students (See graph 2: ETRI results for the school management pillar). More specifically, the results of this pillar at the practice level show that:

- **School strategy:** 100 percent of school principals report having a digital strategy or a plan to incorporate the use of ICT into teaching and administration at their school.

- **Leadership:** 94 percent of school principals report that they are involving teachers in the development of a plan to apply ICT in the school. Also, 100 percent of principals report they are supporting teachers in trying out new ways of teaching with ICT as well as creating spaces for discussions on the advantages and disadvantages of teaching and learning with ICT.

- **Prioritization:** the share of school principals that report ensuring students have the skills to use ICT is important for basic computer functions is 99 percent, accessing and using information is 96 percent, using digital devices safely and appropriately is 94 percent, and improving their learning generally is also 94 percent.

At the policy level, the school management pillar is also strong. School principals report that the responsibilities related to ICT are clear, they use the guidelines provided by the MOET, and they participate in training programs. More specifically, results of the school management pillar at the policy level show that:

• **Responsibility:** 97 percent of school principals reported that responsibilities for integrating ICT use into schools' strategic plans are assigned at the national, sub-national, local, or school levels.

• **Guidance:** 92 percent of school principals are aware of guidelines to incorporate ICT into teaching and learning activities and 87 percent find useful guidelines to incorporate ICT into teaching and learning activities.

• **Support:** 94 percent of school principals report attending or participating in training on the use of ICT in school over the last 12 months and 74 percent report the training was required.

Graph 2: ETRI results for the school management pillar

2. TEACHERS

2.1 WHAT DOES THE TEACHER'S PILLAR MEASURES AND WHY DOES IT MATTER?

This pillar assesses the readiness of teachers to use ICT to prepare and conduct lessons. At the practice level, the indicator for the EdTech Readiness Index that relates to teachers and teaching measures two aspects: (i) self-efficacy in the use of ICT, and (ii) the use of ICT to prepare the lessons and conduct them. Regarding the first aspect, teachers' perception of their ability to use ICT for teaching, self-efficacy practice (Lawrence & Tar, 2018), and the extent of collaboration among teachers (Fraillon, et al., 2019) are all key factors associated with the effective use of ICT in the classroom. Regarding the use of ICT in teaching and learning activities (i.e. CAL: Computer-Assisted Learning models)[4], results indicate that the use of ICT to support students to develop particular skills have the potential of improving students' learning outcomes (Bernard, et al., 2018), particularly in Mathematics (Escueta, et al., 2017) and when used as a support for instruction. In this case, the evidence highlights that the use of ICT is more effective when students use digital education resources, the quality of the implementation is sustained and appropriate teacher training and professional development are provided (Chauhan, 2017).

At the policy level, the EdTech Readiness Index regarding teachers tracks three aspects: (i) the existence of standards or a digital competency framework, (ii) the presence of a support system for teachers through training and professional development, and (iii) the presence of an evaluation system. It is important to track these aspects, as evidence shows a key driver for the effective use of digital technologies is teachers' ability to integrate them meaningfully into daily teaching practice and tailor them to specific subjects and specific activities within those subjects (OECD, 2019). In this regard, EdTech policies should promote the definition of digital competence frameworks for teachers (Redecker & Punie, 2017) as well as implement teacher professional development programs to support teachers to acquire the competences that meet accepted quality standards (Chai, 2019).

2.2 WHAT ARE THE RESULTS FOR THE TEACHER'S PILLAR IN HCMC?

The results for this pillar at the practice level show that most teachers report being confident in using ICT for research and presentations and encourage students to use it for research. However, most teachers are not using ICT in their teaching or in collaborating with other teachers; this lack of use may be related to training, since almost 40 percent of teachers manifested that they have not received training on how to use ICT for teaching (See graph 3: ETRI results for the teacher's pillar). More specifically, the results of the teacher's pillar at the practice level show that:

- **Self-efficacy:** 78 percent of teachers report being confident in their own ability to contribute to online discussions or forums, and the same percentage feel confident to prepare lessons in which students use ICT and to use a spreadsheet for keeping records. 84 percent of teachers believe they can produce presentations for use in class and 85 percent report being confident in assessing student learning using ICT. 73 percent report being confident in their own ability to collaborate with colleagues using shared resources.

[4] *The term "computer" is used based on the traditional concept of "Computer Assisted Learning/Instruction", however nowadays it includes the use of a variety of ICT devices.*

• **Use of ICT for planning:** 99 percent of teachers report searching for content to use during class, 84 percent report preparing presentations to use for teaching, 76 percent manifest they share educational content with other teachers, 79 percent develop or deepen knowledge about the use of teaching and learning technologies, and 71 percent to carry out administrative class management. However, only 31 percent report participating in projects developed with others.

• **Use of ICT teaching:** the share of teachers who report using ICT to search for information for discussions is 34 percent, using ICT to present information during instruction is 42 percent, using classroom management tools is 17 percent, asking students to search for information is 16 percent, asking students to present results using ICT is only 6 percent, and using digital tools to assess students' learning is 16 percent.

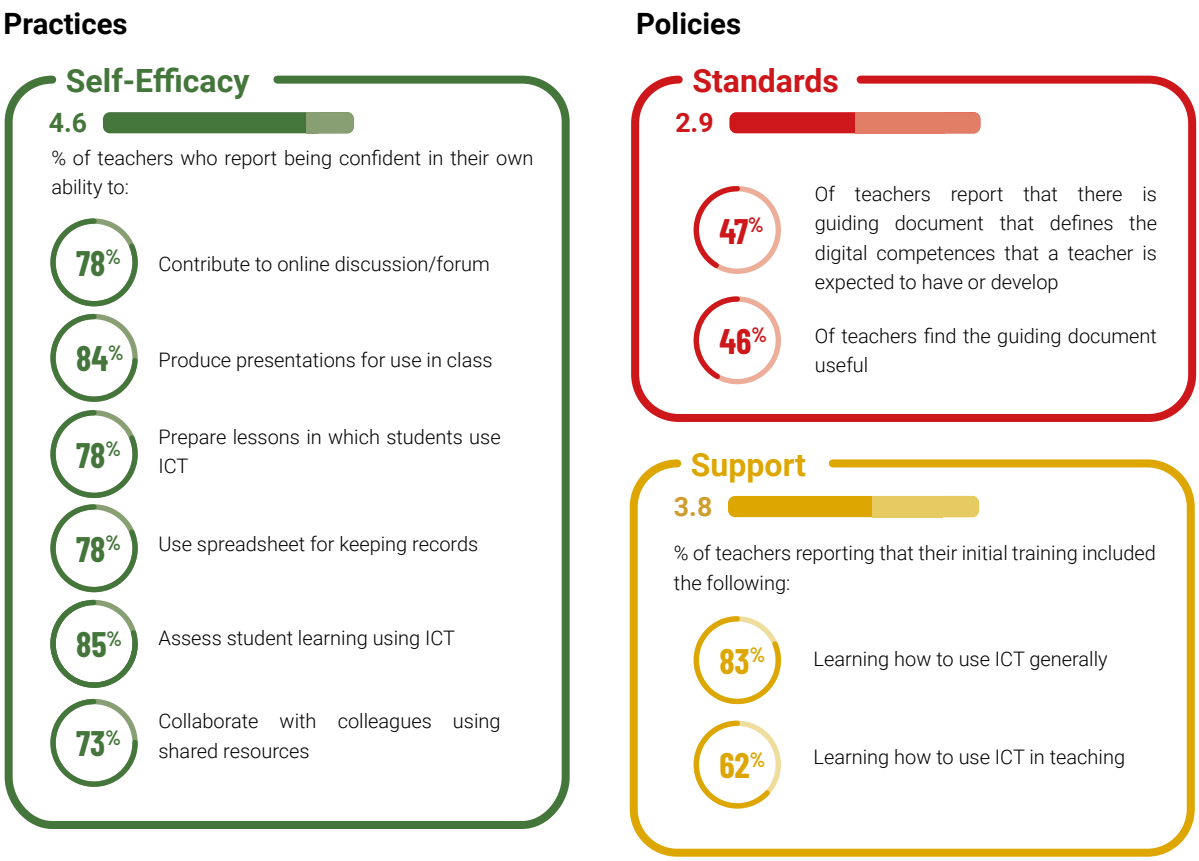
At the policy level, most teachers report they have received general training in the use of ICT and have been evaluated on their use of ICT. However, fewer teachers have received specific training in the usage of ICT for teaching and even fewer have reported that there are standards defining the digital competences that teachers are expected to achieve. The specific results of the teacher's pillar at the policy level:

• **Standards:** 47 percent of teachers report that there is a guiding document that defines the digital competences that a teacher is expected to have or develop and 46 percent of teachers find the guiding document useful.

• **Support:** 83 percent of teachers report that their initial training included learning how to use ICT generally, and 62 percent learning how to use ICT in teaching. Although it was not required, 80 percent of teachers reported participating in professional development activities on using ICT in teaching and learning practices.

• **Evaluation:** 74 percent of teachers report having been formally evaluated on their use of ICT during the last school year.

Graph 3: ETRI results for the teacher's pillar



Use - Planning

4.3

% of teachers reporting doing the following using digital devices while preparing/planning their lessons:

- **99%** Searching for content to use during class
- **76%** Sharing educational content with other teachers
- **31%** Participating in project developed with other
- **84%** Preparing presentations to use for teaching
- **79%** Expanding your knowledge about the use of ICT
- **71%** Carrying out administrative class management

Use - Teaching

2.4

% of teachers reporting doing the following during direct class instruction

- **34%** Using ICT to search for information for discussions
- **42%** Using ICT to present information during instruction
- **17%** Using classroom management tools
- **16%** Asking students to search for information
- **6%** Asking students to present results using ICT
- **16%** Using digital tools to assess students learning

Support

- **80%** Of teachers report participating in professional development activities on using ICT in teaching and learning practices, but it was never required

Evaluation

3.9

- **74%** Of teachers report having been formally evaluated on their use of ICT during the last school year

3. STUDENTS

3.1 WHAT DOES THE STUDENT'S PILLAR MEASURES AND WHY DOES IT MATTER?

The indicator for the EdTech Readiness Index that relates to students assesses the performance of students in using ICT in and outside school. The indicator tracks three aspects at the practice level: (i) the self-efficacy of students in using ICT, (ii) the use and frequency with which students use ICT inside the school, and (iii) the use and frequency with which students use ICT outside the school. It is important to measure these aspects, as studies have found that students' daily use of ICT devices at home and experience with ICT were consistently and strongly related to Computer and Information Literacy (CIL), also their use of productivity software was positively associated with student CIL and their confidence in using general ICT applications. However, no clear relation was found between the use of ICT for school-related purposes and CIL score (Fraillon, et al., 2019).

At the policy level, the EdTech Readiness Index regarding students tracks three aspects: (i) the existence of a digital competency framework for students, (ii) the integration of ICT in activities in the curriculum and outside the school, and (iii) the existence of an assessment of ICT competences. It is relevant to measure these aspects because countries are increasingly interested in the development of digital skills among students; thus, it is relevant to incorporate these skills in the curriculum (across grades and subject areas) and define strategies to develop and a mechanism to evaluate them.

3.2 WHAT ARE THE RESULTS FOR THE STUDENT'S PILLAR IN HCMC?

Only a bit more than half of teachers surveyed report that students use digital devices in school, and outside of school the use of devices is mostly for research and communicating through social networks or email (See graph 4: ETRI results for the student's pillar). The specific results of the student's pillar at the practice level are shown below:

- **Self-efficacy:** the share of teachers who report thinking that at least half of the students can independently open a new tab in a browser is 88 percent, saving a photo that they find online is 89 percent, finding a website they have visited before is 84 percent, and checking if the information found online is true is 61 percent.

- **ICT use inside the school:** the percentage of teachers who report students use digital devices while in school in most lessons to search for information for lesson exercises is 76 percent, to communicate with students on projects is 66 percent, to share assignment results with students is 59 percent, to submit completed work for assessment is 61 percent, to evaluate information resulting from a search is 56 percent, and to produce documents, presentations, or videos is 69 percent.

- **ICT use outside the school:** the share of teachers who believe students use digital devices outside of school at least once a week to browse the Internet for schoolwork is 93 percent, to communicate with teachers through social networks or email is 97 percent, to do homework on a digital device is 73 percent, and to use learning apps or websites is 83 percent.

Given the low level of reported use of ICT both in and outside schools, surprisingly almost all teachers report that the education curriculum recommends using ICT for teaching. Thus, the missing pieces could be standards on competences, more specific guidelines, and training on how to use ICT for teaching. Results of the students' pillar at the policy level show that:

• **Framework:** 30 percent of teachers report that there is a guiding document defining the digital competences that students are expected to have or develop.

• **Curriculum:** 99 percent of teachers believe that the educational curriculum recommends using ICT in teaching.

• **Assessment:** 80 percent of teachers report that the digital competences of students were formally assessed.

Graph 4: ETRI results for the student's pillar

Use - Outside

4.1

% of teachers who believe students use digital devices outside of school at least once a week for:

- **93%** Browsing the internet for schoolwork
- **97%** Communicating with teacher (social networks or email)
- **73%** Doing homework on a digital device
- **83%** Using learning apps/websites

4. DEVICES

4.1 WHAT DOES THE DEVICES PILLAR MEASURES AND WHY DOES IT MATTER?

The indicator for the EdTech Readiness Index that relates to devices assesses the readiness to use digital devices in teaching and learning as well as their availability in schools. The indicator tracks three specific aspects at the practice level: (i) the availability of devices, (ii) students' access to the devices, and (iii) the existence of technical support. It is critical to measure these aspects because studies have shown that insufficient access to digital devices is one of the main factors hindering ICT integration into teaching (Ertmer, Ottenbreit-Leftwich, Sadik, Sendurur, & Sendurur, 2012); however, how much technology and what type of applications should be available for the use by teachers and students is less clear. In this regard, as highlighted by the different digital adoption frameworks (ISTE, 2020), a basic condition is the effective availability of ICT devices that can be used in teaching and learning activities when and how is required (Martínez & Ramos, 2020). The framework highlights the importance of the availability of appropriate technical support for the usage of devices in schools.

At the *policy* level, the EdTech Readiness Index regarding devices measures three aspects: (i) the existence of availability standards, (ii) the existence of monitoring tools, and (iii) the existence of responsibility. It is important to provide guidance on the expected standards that schools should meet to ensure enough availability and access to ICT devices (Kampylis, et al., 2015), including organizational arrangements to ensure the availability of the ICT devices such as timetables, conditions for the provision of technical and pedagogical support for the use of the equipment, and requirements for the administration and maintenance of digital devices.

4.2 WHAT ARE THE RESULTS FOR THE DEVICES PILLAR IN HCMC?

Available digital devices in schools are mostly working, but are still somewhat insufficient in number. Although most working devices in schools are available to students, but still approximately 20 percent of teachers are not promoting the use of digital devices in class at least once a week. An additional pressing challenge is that these devices are not adapted for students with special needs. More specific results of the devices pillar at the practice level show that:

- **Student access:** on average, 81 percent of all devices in the school are reported to be working. Also, 83 percent of school principals agree that there are enough digital devices for instruction.
- **Student use:** 78 percent of teachers report that digital devices available at the school were used in class at least once or twice a week. However, only 4 percent of school principals report that the school has digital devices that are adapted for the use of students with disabilities.
- **Tech support:** 87 percent of school principals agree that there is sufficient technical support to maintain ICT resources so that they are fully functional.

Results of the devices pillar at the policy level show that most school principals report that there is a system within schools to monitor access and usage of functioning digital devices. A remaining challenge is that despite 87 percent of school principals agree that there is sufficient technical support to maintain ICT resources, there is poor clarity on the responsibility (See graph 5: ETRI results for the devices pillar).

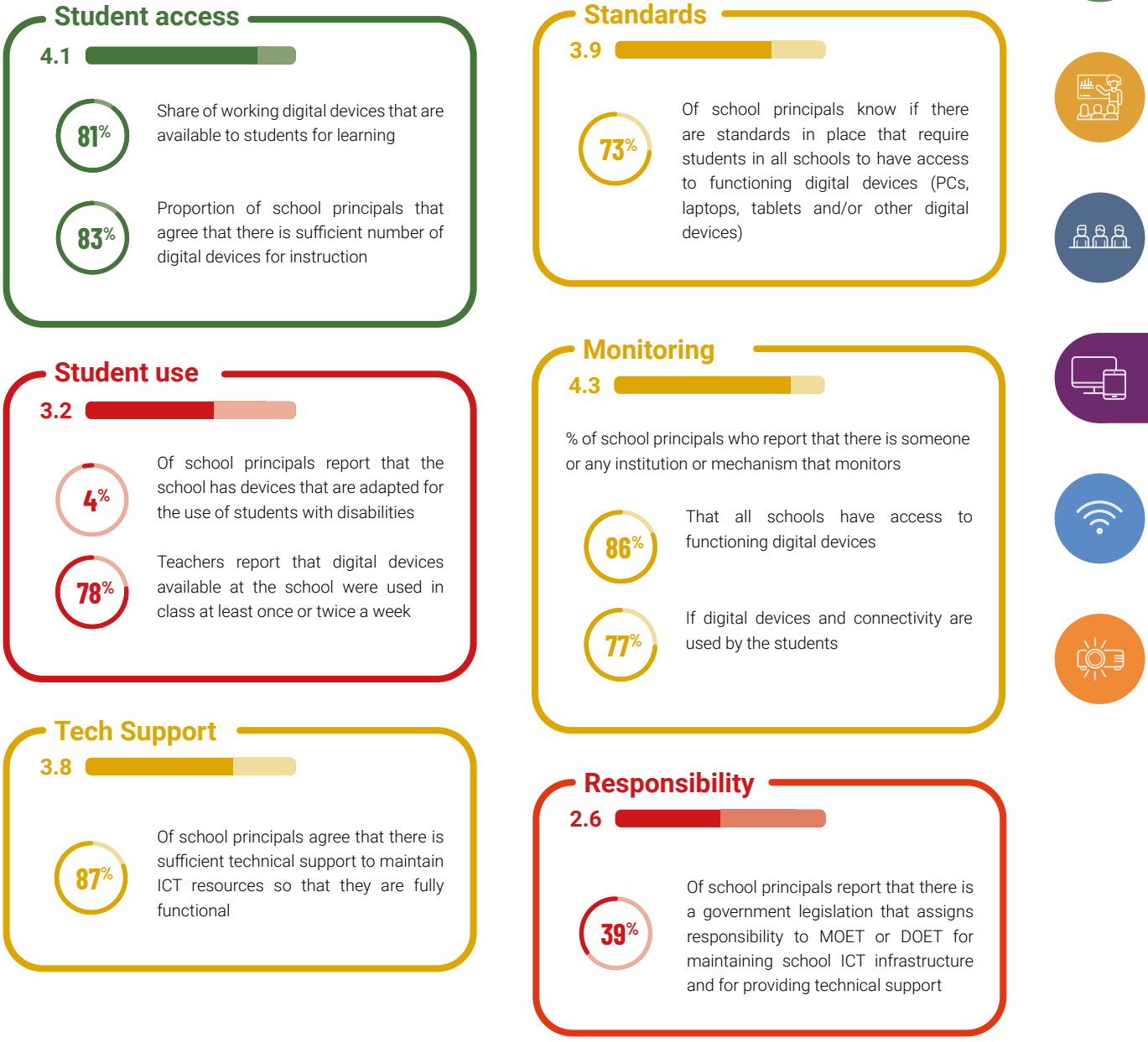
- **Standards:** 73 percent of school principals know if there are standards in place that require that students in all schools have access to

functioning digital devices such as PCs, laptops, tablets, and/or other digital devices.

• **Monitoring:** 86 percent of school principals report that there is a monitoring system to measure that schools have access to functioning digital devices and 77 percent report there is monitoring to track if digital devices and connectivity are used by the students.

• **Responsibility:** Only 39 percent of school principals report that there is a government legislation that assigns responsibility to MOET or DOET for maintaining school ICT infrastructure and for providing technical support.

Graph 5: ETRI results for the student's pillar



5. CONNECTIVITY

5.1 WHAT DOES THE CONNECTIVITY PILLAR MEASURE AND WHY DOES IT MATTER?

At the practice level, the indicator for the EdTech Readiness Index that relates to connectivity assesses the readiness of schools to connect students to the Internet. The indicator tracks three specific aspects: (i) the level of connectivity available, (ii) student access to the Internet, and (iii) the perceived quality of the connectivity. The availability of good quality Internet connection is a basic condition to realize the potential of ICT in teaching and learning. Since there are many factors that can alter the download speed during the implementation of some activities at a given moment or day, the users' general perception of the quality of the Internet connection can provide a reasonable measure.

At the *policy* level, EdTech policies should define strategies to ensure equitable and quality access to the Internet, including: (i) a clear definition of strategies to ensure the availability of Internet in both urban and rural schools, (ii) develop a mechanism to moderate the cost of its use in education to make it affordable, and (iii) define standards for the quality of Internet connectivity and a strategy to meet them. Regarding the quality of Internet connectivity, using a very simplified model, and considering that the recommendations vary enormously[5], it is possible to estimate different scenarios of connectivity based on the availability of computers in the school and the type of activities or intensity of the use of Internet (e.g. basic: web browsing v/s intensive, video streaming).

5.2 WHAT ARE THE RESULTS FOR THE CONNECTIVITY PILLAR IN HCMC?

At the practice level, school principals report that all schools have Internet access and almost all devices are connected to the Internet. However, the quality, speed, and stability of the Internet connectivity can be improved across the board. More specific results of the connectivity pillar at the practice level show that:

- **Availability:** 100 percent of schools have Internet access.
- **Student access:** 99 percent of devices available to students are connected to the Internet and 86 percent of school principals believe that there is a sufficient number of digital devices connected to the Internet.
- **Quality:** 89 percent of school principals believe that there are enough digital devices connected to the Internet and 80 percent consider that Internet stability is sufficient.

At the policy level, although most school principals report that there is a monitoring system for Internet connectivity, almost half of principals also do not know about the existence of a government strategy to provide connectivity in schools. Even more challenging, if schools have connectivity problems, support is seen as greatly lacking. More specific results of the connectivity pillar at the policy level show that:

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[5] *In the USA the current goals are to provide at least 1 Mbps per student and the recommendation of SEDTA is between 1.4 and 2.8 Mbps per user depending on the size of the district (Fox & Jones, 2019).*
In Chile the recommendation of the Ministry of Education for the schools that have Internet in all classrooms and 400 or more students is 50 Kbps per student. See http://innovacion.mineduc.cl/wp-content/uploads/sites/108/2019/09/Orientaciones_para_el_Estandar_Aulas_Conectadas_2022.pdf.
The UIS-Cetic.br "Practical Guide to Implement Surveys on ICT Use in Primary and Secondary Schools" defines three groups of connection speeds: up to 2Mbps, between 3 and 20 Mbps, and higher than 20 Mbps (Martínez & Ramos, 2020).
The Project Connect that is part of the initiative "GIGA – Connecting Every School to the Internet" aims to map every school in the world to provide real-time data assessing the quality of each school's Internet connectivity uses 3 Mbps threshold connection speed. For other reviews see: Ford and Herselman (2017)

• **Plan:** 58 percent of school principal believe that the government have any strategy or plan to provide or facilitate Internet connectivity to all schools.

• **Monitoring:** 80 percent of school principals report that there is a mechanism to monitor the availability of Internet connection in the school.

• **Support system:** only 31 percent of school principals believe that, if the school has problems with Internet connectivity such as stability and low bandwidth, there is a system or mechanism at the government level to assist and resolve the problem.

Graph 6: ETRI results for the connectivity pillar

6 . DIGITAL EDUCATION RESOURCES

6.1 WHAT DOES THE DIGITAL RESOURCES PILLAR MEASURES AND WHY DOES IT MATTER?

At the practice level, the indicator for the EdTech Readiness Index that relates to this pillar assesses the readiness of the school to use quality digital education resources – DER. DERs include both platforms and content for teaching and learning. The indicator tracks three aspects: (i) access to digital resources, (ii) use of digital resources, and (iii) quality of digital resources. It is important to measure these aspects because research shows that the availability of digital education resources key is a factor associated with the use of ICT in the classroom (Gil-Flores, et al., 2017), specifically when DER are aligned to the curriculum and pedagogical practices defined by the school (ISTE, 2020). Thus, schools should develop the capacity to search, identify, select, and purchase appropriate software and/or resources from the Internet to ensure the appropriate availability of DER to teach different subjects.

At the policy level, the digital education resources pillar measures three aspects: (i) the existence of digital resources, (ii) the creation of digital resources, and (iii) the quality standards. Even before implementing strategies to enable and foster the use of digital resources to support learning, countries should define standards that ensure the quality of DER and a mechanism to evaluate them. Some of the key aspects to consider in the evaluation are: technical quality (functional and usability aspects), inclusiveness (free of any cultural, gender, or another form of bias), responsiveness (possible to be used on multiple devices, including mobile phones), and curriculum alignment (content and pedagogy).

6.2 WHAT ARE THE RESULTS FOR THE DIGITAL RESOURCES PILLAR IN HCMC?

Access to quality DERs could be improved in practice, mainly for students with special needs. Most importantly, improvement should focus on ensuring that available DERs are used by students and teachers. Although traditional software such as word processing and browsing are used to some extent, more sophisticated digital tools such as collaborative software and digital learning games are rarely used. More specific results of the DER pillar at the practice level show that:

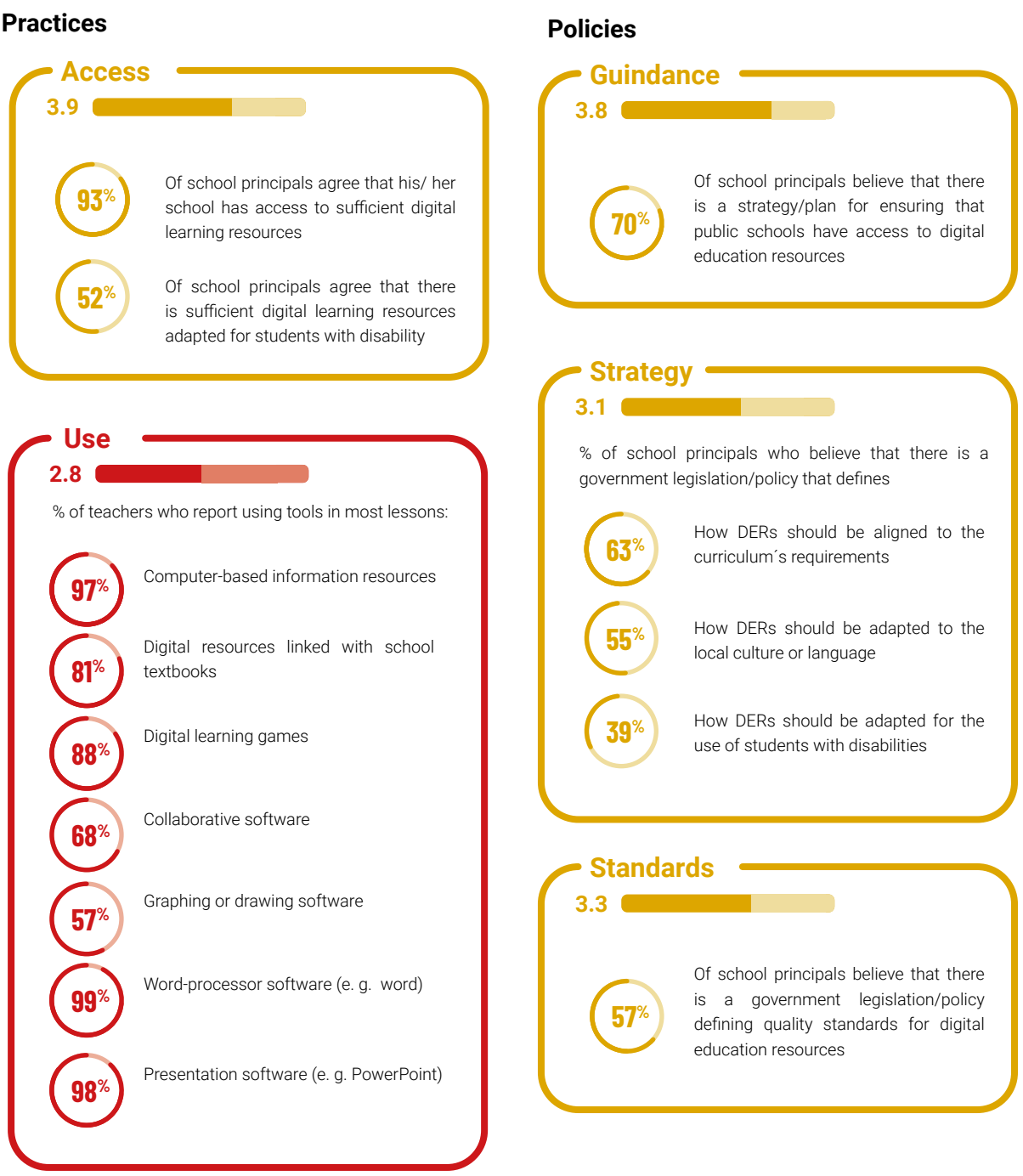
- **Access:** 93 percent of school principals agree that his/her school has access to sufficient DERs, but only 52 percent of school principals consider that there are sufficient digital learning resources adapted for students with disability.
- **Use:** the share of teachers who report using in most lessons DER tools – 97 percent use computer-based information resources, 81 percent use digital resources linked with school textbooks, 88 percent use digital learning games, 68 percent use collaborative software, 57 percent use graphing or drawing software, 99 percent use word-processor software, and 98 percent use presentation software such as PowerPoint.
- **Quality:** the share of school principals who agree that in his/her school there are available digital learning resources of adequate quality is 89 percent, available digital learning resources are aligned to the needs of the curriculum is 92 percent, and available digital learning resources are adapted to the local context is 80 percent.

On the policy side, DERs strategy should be improved, especially keeping in mind specific needs of students with disabilities. Also, though most principals believe that there is a strategy for access to DERs, they also believe that

legislations lack sufficient definition of quality standards and guidance on adapting DERs to the curriculum, local culture, and students with disabilities. More specific results of the DER pillar at the policy level show that:

- **Guidance:** 70 percent of school principals believe that there is a strategy or plan for ensuring that public schools have access to digital education resources.
- **Strategy:** the share of school principals who believe that there is a government legislation that defines the alignment of DERs to the curriculum's requirements is 63 percent, the adaptation of DERs to the local culture or language is 55 percent, and the usage of DERs by students with disabilities is 39 percent.
- **Standards:** 57 percent of school principals believe that there is a government policy defining quality standards for digital education resources.

Graph 7: ETRI results for the DER pillar



Quality

3.7

% of school principals who agree that, in his/her school

89% Available digital learning resources are of adequate quality

92% Available digital learning resources aligned to the needs of the curriculum

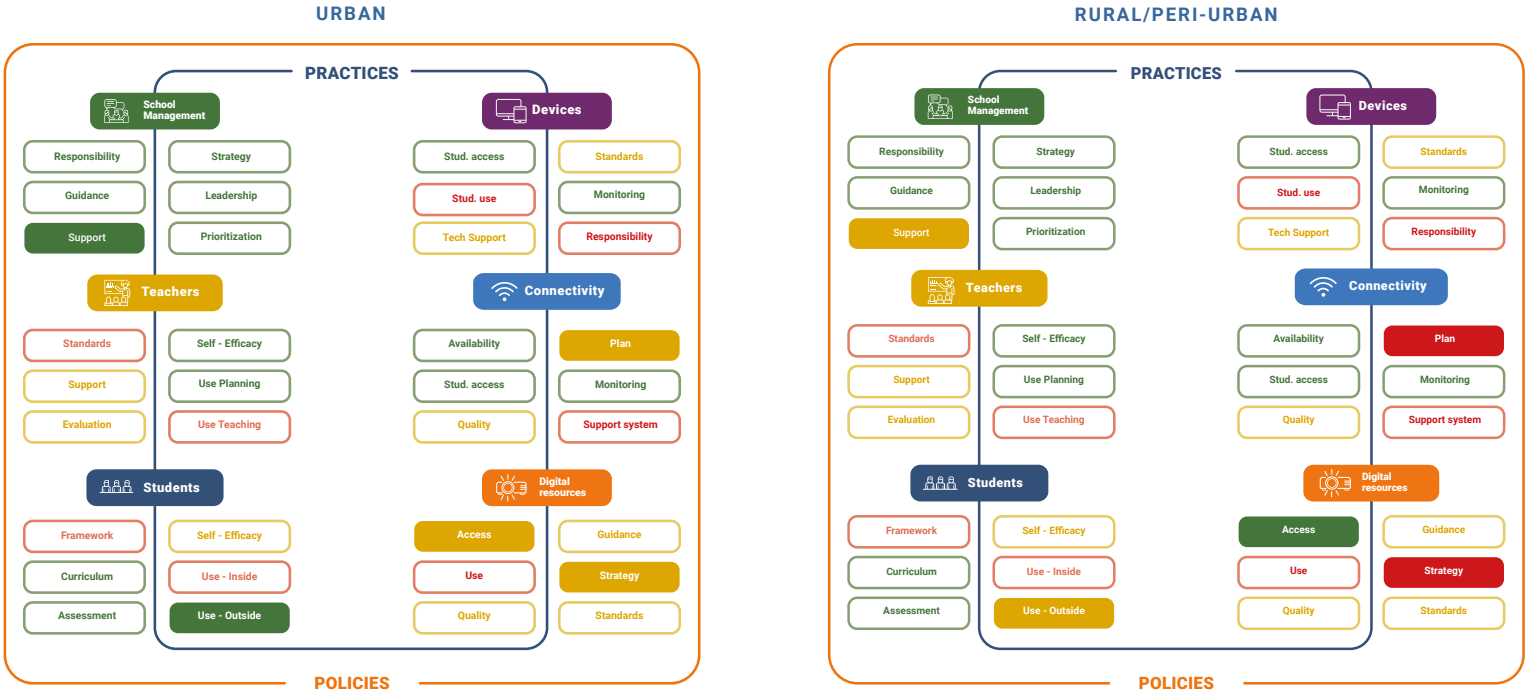
80% Available digital learning resources are adapted to the local context

IV.I. ETRI RESULTS BY PILLAR

WHAT ARE THE GROUP-LEVEL RESULTS BY LOCATION IN HCMC?

The observed results only show a few differences across location. There are more principals at urban schools (than rural/peri-urban schools), who believe that there is a strategy for connectivity and digital resources at their school and report having participated in training in this matter. Also, urban schools in HCMC report better support through useful guidelines and training to incorporate ICT into teaching and learning activities. However, rural/peri urban schools are ahead of urban schools in terms of student access to digital resources (See graph 8: ETRI group level results by location)[6]. The few differences across location6 may be because HCMC's population is highly concentrated in urban areas, with 78 percent of its approximately 9 million population living in urban areas (Indochina Research, 2017).

Graph 8: ETRI group-level results by location



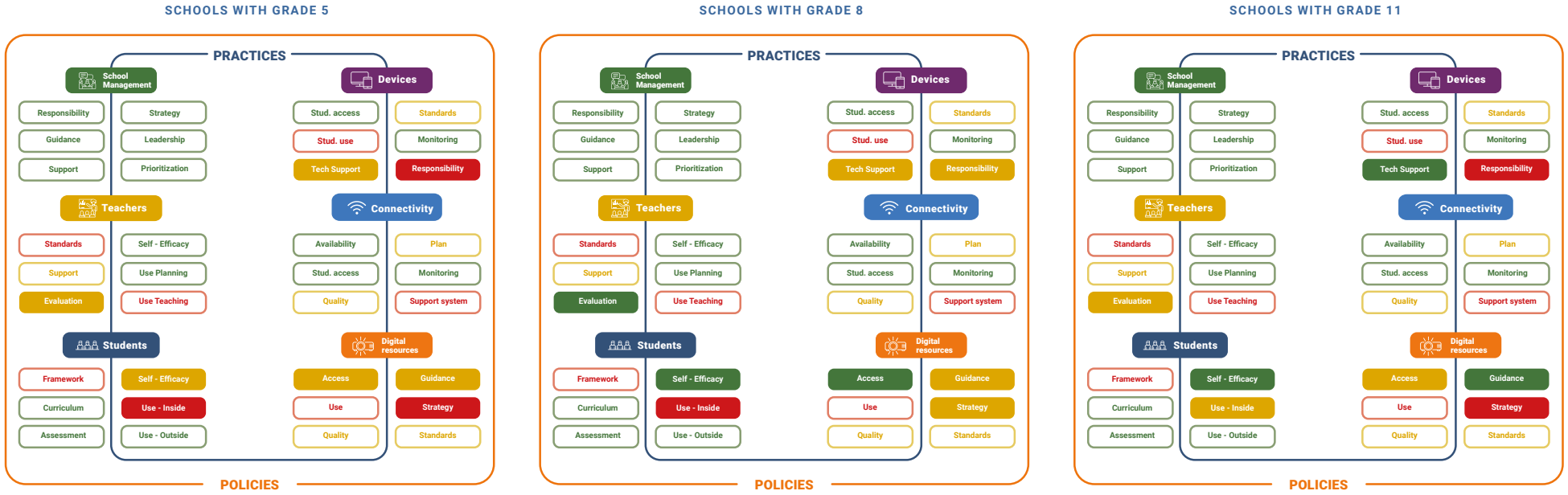
[6] *For a better analysis of graphs 8 and 9, dimensions with bold lines and more intense colors are the ones where more differences were observed by informants' responses. In other words, in the bolded dimensions special attention is needed to secure there are equality of opportunities regardless of the geographical location.*

WHAT ARE THE GROUP-LEVEL RESULTS BY GRADE IN HCMC?

At the practice level, the main differences across grades are around students and digital resources. Students in grades 8 and 11 score higher in self-efficacy when using ICT than students in grade 5. In the digital resources pillar, schools with grade 8 have higher access to DERs than schools with grades 5 and 11. In terms of student's ability in using ICT, teachers believe that students do use ICT inside and outside school increases with grades. Use inside the classroom remains the weakest among the three indicators at all levels.

At the policy level, school principals believe in the existence of a government strategy or plan to provide or facilitate Internet connectivity and DERs to all schools, but it needs special attention in schools with grades 5 and 11. However, schools with grade 11 have a better perception of guidance on digital resources (See graph 9: ETRI group level results by grade).

Graph 9: ETRI group level results by grade



IV RECOMMENDATIONS FOR HCMC

V. RECOMMENDATIONS FOR HCMC

Vietnam is classified as a lower middle-income country and while it has been a development success story, it also faces a range of challenges. Vietnam's human capital index is 0.69 out of a maximum of one, the highest among lower middle-income economies. While the country has increased the average duration of schooling to 10.2 years, second only to Singapore among the Association of Southeast Asian Nations countries, improving the quality of education is still one of the most pressing challenges. This can be achieved through increased investment in education and training, improving the quality of teaching and learning resources, and strengthening monitoring systems to track progress. Another key challenge for Vietnam and HCMC is consolidating institutional capacities, which requires strengthening governance structures, developing effective policies and regulations, and improving administrative systems. By addressing these and other economic challenges, Vietnam can improve its economic and social outcomes, and move towards its development aspiration to become a high-income country by 2045.

Even if Vietnam and HCMC continue to increase the investment in education and training, a framework and a coherent strategy are required to guide the implementation of EdTech policies. Equally important, additional factors need to be taken into consideration such as strengthening teachers' human capacities, increasing access and quality of devices and DERs, ensuring meaningful connectivity, and guaranteeing monitoring and evaluation tools are efficiently implemented. A summary of the key recommendations is presented below.

1. IMPROVE COHERENCE AND QUALITY ASSURANCE OF THE EDTECH STRATEGY

It is important to design strategies to ensure the alignment between the policy and its implementation (practice). Before investing in and deploying devices and digital resources, policymakers must ask what education challenges need to be addressed and what resulting change is desired when the EdTech strategies are implemented. Thus, a critical first step to ensure coherence of HCMC's EdTech strategy is to articulate and disseminate a clear purpose and vision for the use of technology to support education. Robust visions are concise and specific, informed by a situation analysis, and aligned with broad national development priority areas. The EdTech strategies should not only be aligned with this vision, but also with the specific goals of the education sector plans and the cross-sectoral digital transformation or ICT plans of HCMC and Vietnam. Finally, an iterative approach can be useful to develop a robust EdTech strategy that is aligned and informed by the specific vision and priorities of the country or region (See Box 1: Korea's iterative approach to EdTech strategy).

BOX 1: KOREA'S ITERATIVE APPROACH TO EDTECH STRATEGY

In Korea, the role of government is seen as critical in introducing ICT-assisted innovations. In 1999, Korea's government established a new institution, The Korea Education and Research Information Service (KERIS) to enhance education and research competitiveness of Korea by innovating traditional education and knowledge sharing system using ICT.

KERIS has developed different master plans for education informatization. These master plans reflect Korea's iterative approach to EdTech strategy and the dynamic development of the use of ICTs within the Korean education system and tried to utilize better ICTs for innovation in education.

- **Master plan I (1996-2000):** developed in collaboration with schools and universities, with a focus on infrastructure, supplying PCs to teachers and students, and providing Internet connection to classrooms by 2000.
- **Master plan II (2001-2003):** targeted strengthening computer usage and education in schools, standardizing multimedia content for education, building a digital library system, facilitating online learning at home by providing multimedia content created by the Korean Education Broadcasting System (EBS) through the Internet, and boosting teachers' capability to use ICT for education.
- **Master plan III (2006-2010):** aimed to upgrade Korea's education informatization policy by introducing mobile ICTs for e-learning. Also, a 'self-learning' management system was developed to evaluate students' knowledge level, propose customized learning paths, and keep students' records of studying.
- **Master plan IV (2010-2014) and Smart Education Masterplan:** students can choose the learning paths that best suit their individual needs, and teachers play roles not as knowledge transferors but as facilitators or mentors who evaluate individual student's needs, give advice, and suggest alternative learning paths.

Source: Building and sustaining national ICT/education agencies: Lessons from Korea (KERIS)

After the vision is created and the EdTech strategy is clear, policymakers should work on setting specific targets and developing monitoring tools to provide a better understanding of progress made towards the main objectives of HCMC's EdTech strategy. To monitor the quality implementation of HCMC's EdTech strategy, instead of adopting a single action or methodology, it is advised to deploy a comprehensive system of regular monitoring strategies and assessment tools. This comprehensive system will equip policy-makers with instruments that inform the education community in real-time (or as regularly as possible). Effective monitoring could enable the needed adaptations, depending on the context and needs. This system would also allow policy-makers to make the necessary corrective or supportive actions to ensure that schools (principals, teachers, and students) receive the guidance and/or support that they need to benefit from information technologies (See table 1 of resources on developing a strong vision and quality assurance).

Table 1: List of resources to develop a strong vision and quality assurance

	AUTHOR	RESOURCE
VISION	The World Bank, 2016	SABER-ICT Framework Paper for Policy Analysis
	The World Bank, 2019	Reimagining human connections - Technology and Innovation in Education
	The EdTech Hub, 2022	National EdTech strategies: what, why, and who
QUALITY ASSURANCE	The EdTech Hub	Monitoring Distance Education
	The EdTech Hub	A Monitoring and Evaluation Framework for Blended Learning
	The EdTech Hub, 2020	Using EdTech to Support Effective Data Monitoring: A Curated Resource List

REFLECTION (EDTECH STRATEGY) FOR HCMC'S POLICYMAKERS

Q1: What education challenges need to be addressed and what resulting change is desired when the EdTech strategies are implemented?

2. PUT TEACHERS AND STUDENTS AT THE CENTER OF THE EDTECH STRATEGY

Technology should enhance teacher engagement with students through improved access to content, data, and networks, helping teachers better support student learning. The COVID-19 pandemic has evidenced the critical role that teachers play. Sustained professional development through pre-service and in-service teacher training can be effective to equip teachers with tools to integrate ICT's into the teaching and learning process. Teachers' digital and pedagogical skills are required to assess and decide when and how to effectively adopt digital strategies and realistically define their impact to support or enhance learning.

The ETRI results indicate the importance of planning remedial and supportive mechanisms to guide the role of teachers in both pre-service and in-service environments to use technology in teaching. These support mechanisms are important to strengthen teachers' ability to integrate technology into their pedagogical practices, as opposed to planning or administrative functions. The results also indicate the need for more advanced capacities among teachers in areas such as planning, evaluation, or self-efficacy. At the policy level, teachers require solid guidance documents (See Table 2: List of resources to support teachers), which may evolve over time as EdTech is integrated into teaching and learning activities, for the effective incorporation of educational technologies. Standards could guide what digital competences, training and practices are expected from teachers.

BOX 2 : TEACHERS AT THE CENTER OF SINGAPORE'S EDTECH STRATEGY

Singapore's national EdTech Plan contains actionable subcomponents that will help enable the success of the larger strategy's ambitions, aspirations, and intentions. Singapore's envisions that over the next 5 to 10 years, educational technology will help make education more:

- **Self-Directed:** By developing pedagogy, tools, and structures to help students develop intrinsic motivation and take ownership of their learning.
- **Personalized:** By creating learning experiences that customize the pace and path that cater to each child's needs.
- **Connected:** By developing collaborative learning experiences and connecting students' learning to the community and the world.
- **Human-centered:** By leveraging a data-driven understanding of how students' interests, attitudes and motivations can optimize learning.

Singapore's EdTech plan also offers specific considerations and action items for educators. Teachers can share lessons learned and good practices with each other through in-person or virtual groups. More specifically, Singaporean teachers are expected to be:

- **Designers of learning experiences who:** create physical and virtual learning environments that empower students to learn, customize learning to cater to each student's needs, and iterate the design of learning experiences for continual improvements to student learning.
- **Skillful practitioners who facilitate active learning in students by leveraging:** technology to mediate learning interactions between students and content, their teachers, their peers and the community, as well as learning data to provide better feedback and targeted interventions to students.
- **Digital learners who continually develop themselves professionally to:** learn and share digitally, and keep up to date with technological developments for teaching and learning.

Source: Singapore's Education Technology Plan, 2021

In regard to students, the ETRI results indicate that, though devices are available at the school, it is noted that there is insufficient student access to devices and very limited use of digital resources, particularly within and to a lesser extent outside schools. Given the low level of reported use and considering that Vietnam's education curriculum recommends using ICT for teaching and learning, the missing pieces may be more specific guiding documents, standards, and training programs on how to use ICT for teaching and learning. As important as developing strategies to increase student usage of devices and digital education resources, is ensuring student safety and privacy. EdTech strategies should prioritize ethical approaches and ensure data safety and security, privacy provisions, and digital ethics.

Table 2: List of resources to support teachers and ensure student safety

	AUTHOR	RESOURCE
TEACHERS	The World Bank	Teachers' Skills and Skills Frameworks for Remote and Blended Learning Knowledge Pack
	The World Bank, 2022	Technology-Based Strategies from across the Globe to Enhance Teaching Practices
	The World Bank, 2021	The changing role of teachers and technologies amidst the COVID-19 pandemic
	The EdTech Hub	Teacher Continuous Professional Development (TCPD)
	The EdTech Hub	Curated Tools for Teacher Continuous Professional Development
STUDENT SAFETY AND PRIVACY	UNESCO, 2022	Minding the data: protecting learners' privacy and security
	UNDG	Data Privacy, Ethics and Protection: Guidance note on gig data for achievement of the 2030 agenda
	ITU COP	Child online protection guidelines
	UNICEF	Encryption, Privacy and Children's Right to Protection from Harm
	UNICEF	Child Safety Online
	UNICEF	Child protection advocacy

REFLECTION (TEACHERS AND STUDENTS) FOR HCMC'S POLICYMAKERS

Q2: What are the key digital and pedagogical skills that teachers require to effectively impact the students learning experience?

3. PRIORITIZE ACQUISITION, DISTRIBUTION, AND EFFECTIVE USE OF DIGITAL DEVICES IN SCHOOLS

Devices enable access to high-quality educational content and instruction that would not be available otherwise. The right devices can level the learning ground and increase the number of hours invested in learning. Thus, identifying the right devices to be acquired and distributed to schools, as the city of Taipei in Taiwan did during the pandemic, is an element of the solution that aims at enhancing learning in a specific context and it should be guided by a clear and precise vision of bettering education's quality, accessibility, equity, and relevance (See Box 3: Ensuring access to devices for education during the pandemic).

BOX 3 : ENSURING ACCESS TO DEVICES FOR EDUCATION DURING THE PANDEMIC

During the pandemic, education authorities across different countries and regions created different approaches to ensure students and teachers had access to digital devices for remote and remedial learning:

- **Taipei:** Schools were required to revise their inventory of usable technological devices such as tablets and laptops, as well as devices that students had available at home. If schools were in short supply of some of these devices, they could report to authorities and apply for more.
- **Edo:** According to data from the Demographic and Health Survey, 91% have a mobile phone but few have access to computers. Thus, EdoBEST@Home developed a unimodal mobile-based remote learning program that includes interactive audio lessons, digital self-study activity packets, digital storybooks, mobile interactive quizzes, learning guides for parents and virtual classrooms that enable interaction between teachers and students.

Source: How Learning Continued during the COVID-19 Pandemic. Global Lessons from Initiatives to Support Learners and Teachers.

The ETRI results for HCMC indicate several challenges that need to be addressed to optimize the effective use of digital devices in schools. Even though most devices for students are reported to be operational and working, the number of devices is insufficient for instruction, a situation that is also reflected in poor student access to devices. Also, the use of devices for learning is moderate, as 54 percent of teachers indicate that devices at school were used in class at least once or twice a week. Moreover, access to digital devices adapted for students with disability is almost non-existent; a proactive strategy to implement devices and digital resources following a Universal Design for Learning (UDL) approach is required to effectively reach a diverse student population. As students within a classroom have diverse needs, the UDL approach recognizes that devices should follow a design that took into consideration students' needs.

BOX 4: DEVICES SELECTION CRITERIA

The right computing device should be chosen based on the level of technological readiness of the education system, to use case scenarios it needs to support and the current level of technology integration:

- **Hardware technical specifications:** How will you minimize the number of different SKU's (product models and versions) over the lifetime of the project to reduce maintenance costs (stock of different parts and firmware updates)?
- **Form factor:** What is the most appropriate form factor for the user and use cases? Mobile? Touch? Screen size?
- **Connectivity and I/O:** What connectors will be needed? How are the usage policies enforced (do I accept pen drives or not?)?
- **Software stack to be installed:** How many software images will you have to handle? how will you update the software stack over time to ensure the latest versions are available to the users and compatibility is ensured?

- **Embedded or external peripherals required:** Does it require card or biometric readers, webcams, digital pen?
- **Safety and ruggedness:** Is the device well suited for the type of usage (age groups, etc.)? Is it robust and shock-resistant? Is it safe for the user? How is the device usage policy implemented (access to content, etc.)?
- **Storage and charging:** How will devices be charged? Stored? Device's power (watts) requirements (Solar versus grid)? Voltage?
- **Security:** How will the device be protected mechanically (theft) and digitally (cyber-security, viruses, malware)?
- **Privacy:** How will user information be kept safe and private?
- **Maintenance:** How will maximum uptime for all devices be ensured? Who will provide maintenance? SLA's? At what cost? How will the device be managed and updated?

Source: Devices for Education Knowledge Pack, 2022

REFLECTION (DIGITAL DEVICES) FOR HCMC'S POLICYMAKERS

Q3: What strategies can be adopted to evaluate whether specific digital devices will be useful for the majority of students as well?

4. IMPROVE THE EFFECTIVE USE OF DIGITAL EDUCATION RESOURCES

DERs increase student engagement if the content is interactive, help to explain abstract concepts by rendering them in a visual form or through simulations, reduce costs of physical learning materials, support remote and hybrid learning, and support real-time assessment as data linked to digital content use can provide clear learning metrics in real-time.

Although access to DERs is sufficient, a suboptimal use is registered. Traditional platforms and software programs such as word processors or presentation software are widely used, but collaborative software or graphing and drawing softwares are rarely used. Thus, strategies, guidance and standards are needed to improve the access to, and quality of, digital resources. Also, there is room for improvement in adapting DERs to the national curriculum, the local context, and students with disabilities.

BOX 5 : URUGUAY'S CEIBAL DIGITAL EDUCATION RESOURCES

Uruguay's government created Plan Ceibal in 2007 with the aim of supporting education with technology (Plan Ceibal, 2021). Since its implementation, every child who enters the public education system is given a computer for personal use with a free internet connection at school. Uruguay's vast experience with EdTech platforms, the government's investment in technological infrastructure in the last decade, and the selection of appropriate technologies and content to deliver remote learning while schools were closed during the pandemic allowed for high usage of digital education resources. Uruguayan students and teachers have access to the following DERs:

- **REA:** Open repository of educational resources created by teachers for teachers.
- **Biblioteca País:** Virtual library to democratize access to culture and books.
- **Valijas:** Online site with over 150 educational resources for primary and school organized by categories.
- **CREA:** Learning management system for the administration, tracking, delivery of educational courses, and communication between teachers and students.
- **Matific:** Math learning platform for elementary and primary school.
- **Aleks:** Math learning platform for elementary and primary school
- **Lengua:** Spanish learning platform for primary and secondary school.

Source: Ceibal 2023

Table 3: How to implement digital content or DERs for an education system, a six-step process

	PROCESS	DETAIL
STEP 1	**Ask why?:** Establish goals and objectives to be achieved by using digital content	Goals can include remote learning, remedial learning, use by teachers to improve learning, support students, etc.
STEP 2	**Standards:** Establish minimum standards and quality assurance processes	Standards can include formats, technical specs, offline vs online capability, user interface design, accessibility, curriculum alignment / coverage, license types.
STEP 3	**Evaluate:** Adapting digital and aligning (mapping and sequencing) the content to the curriculum	Especially for OERs, content will still need to be mapped and sequenced to the curriculum and evaluated
STEP 4	**Acquisition:** Acquire, procure or develop digital teaching and learning materials	Digital content could be free (OER), commercial or produced in-house. Free and in-house content may not need a formal procurement process.
STEP 5	**Training:** train teachers to use and adapt digital teaching and learning materials	Without training teachers, the content may go unused! Teachers can also be a source to curate or create content.
STEP 6	**Deployment:** Deploy content for use	Deploy content to a Learning Management System, other content repository or container.

Source: Digital Teaching and Learning Knowledge Pack

Q4: How can DERs be used not only for content consumption but to help students to think critically and learn collaboratively?

5. USE CONNECTIVITY AS AN OPPORTUNITY (IF THE QUALITY IS ADDRESSED)

Access to the Internet with sufficient bandwidth affects whether and how EdTech can be used in support of educational goals. Quality access to the Internet creates opportunities to explore new ways of teaching and learning, access to a wider range of digital education resources, and new skills for the digital age. Where the Internet is available, it is also important to ensure that connectivity is meaningful and allows teachers and students to pursue their educational activities without interruption.

ETRI results show that the perception of connectivity (availability and student access to the Internet) in HCMC's schools is considered good as all schools have Internet access, and the quality of connectivity is considered sufficient. However, the education system requires strengthening the strategy to provide high-quality connectivity to all schools, as well as a strong support system to mitigate problems with connectivity, as only 31% of school principals consider that there is a government mechanism to assist schools when there are connectivity issues related to stability and low bandwidth. HCMC schools need additional measures from the government to improve dimensions such as the stability and quality of connectivity – particularly when students and teachers are using digital resources (See box 6 for guidance to achieve connectivity for education).

BOX 6: GUIDANCE TO ACHIEVE CONNECTIVITY FOR EDUCATION

To achieve connectivity for education, UNESCO and the EdTech Hub have developed a list of 8 principles to support governments in the process of ensuring availability, affordability, and quality of Internet connectivity:

- **Conduct a comprehensive assessment of connectivity levels** to understand where connectivity gaps are and ensure data-driven planning.
- **Develop complementary infrastructure** including reliable electricity, before digital technologies are introduced in schools.
- **Be technology agnostic** and consider the existing connectivity options before developing or integrating new technologies.
- **Identify the local infrastructure problems** to select the most appropriate connectivity initiative to fund and support.
- **Build a sustainable and scalable connectivity plan** from the beginning.
- **Identify the challenges of the most marginalized learners** to access connectivity and come up with an action plan to address them.

- **Leverage resources from other local and global initiatives** to develop and improve connectivity.
- **Identify key stakeholders and their roles** in building resilient and affordable connectivity systems.

Source: Ensuring resilient connectivity (EdTech Hub and UNESCO, 2020)

REFLECTION (CONNECTIVITY) FOR HCMC'S POLICYMAKERS

Q5: How can HCMC ensure Internet connectivity is meaningful, stable and with enough speed in the most marginalized communities where Internet infrastructure is limited?

6. PAY SPECIAL ATTENTION TO THE EARLIER GRADES TO IMPROVE CONSISTENCY

The COVID-19 pandemic accelerated the usage of devices and digital education resources in schools, independently of the grade of instruction. Especially in early grades, policymakers and school practitioners must evaluate and decide what non-technological pedagogies and educational tools to preserve and what digital resources can be used to complement the teacher's role and enhance learning. EdTech can be a valuable tool for earlier grades when it follows a research-backed pedagogy and engages students with play-based learning activities.

When comparing results by grade level, the higher the grade, the better the school's principal's perception of EdTech policy implementation. With each grade, the teacher's confidence in the student's ability to use ICT grows, showing incremental improvement as students transition from primary to secondary school. More critical (poorly scored) dimensions are registered in the lower grade (Grade 5), especially in the students, devices and digital resources pillars. When planning strategies to support EdTech such as technical support and guidance for HCMC's schools, the earlier years of education will need special attention to ensure better coherence and consistency across all grades.

BOX 7: EDTECH PROGRAMS IN EARLY GRADES

The following examples have been extracted from the Brookings Institution document "Realizing the promise: How can education technology improve learning for all?" and the OECD's, World Bank and HundrED compilation of continuity stories "How Learning Continued during the COVID-19 Pandemic. Global Lessons from Initiatives to Support Learners and Teachers":

- **India:** Blended learning initiative for students in grades 4 through 9 in which they received 45 minutes of interaction with computer-adaptive learning software for math and language, and 45 minutes of small group instruction before or after going to school. After 4.5 months, the program improved achievement by 0.37 SDs in math and 0.23 SDs in Hindi.
- **Japan:** Tokkatsu (children's council activities, school lunch with lunch servers in small groups and school events, etc.) was not possible in its original face-to-face form in many schools during the pandemic. Japanese educators came up with innovative ways to promote the non-subject education goals while avoiding the new 3 Cs (closed spaces, close-contact settings, crowded places). For example, the Obiyama Nishi Elementary School promoted Tokkatsu using online techniques during school closures. Every day, schedules started with exercise activities or a dance (both provided on YouTube). Classes used LoiLoNote School, seen as helpful in conducting collaborative online interactive lessons; MetaMoJi ClassRoom, which allows collaboration in making newspapers; and Zoom for discussion.

Source: Realizing the promise: How can education technology improve learning for all?, Brookings Institution.

How Learning Continued during the COVID-19 Pandemic. Global Lessons from Initiatives to Support Learners and Teachers.

REFLECTION (EARLIER GRADES) FOR HCMC'S POLICYMAKERS

Q6: How can school managers decide what non-technological pedagogies and educational tools to preserve and what digital resources can be used to complement the teacher's role and enhance learning for students in earlier grades?

7. LEVERAGE THE SCHOOL MANAGEMENT STRENGTHS

Considering that policies related to school management scored higher than the rest of dimensions, HCMC's Department of Education could use its school management expertise as a *backbone* to implement regular planning and monitoring of the EdTech policies and their future implementation and adaptations. For instance, all HCMC's schools that participated in ETRI have a strategy to incorporate ICT into teaching and administration, all principals support teachers in trying out new ways of teaching with digital technologies, and most school principals also report that their responsibilities related to integrating ICT use into the school are clear. Thus, HCMC's policymakers can build on the existing school management strengths to support planning, implementation and monitoring of the existing and future education and technology strategies.

BOX 8: HOW ESTONIA'S MUNICIPALITIES BUILT ON THEIR EDTECH EXPERTISE?

Estonia is highly decentralized. The Ministry of Education is responsible for developing the national education policy, providing funding, and the strategy for the education system. Municipalities supervise most pre-primary schools and general education. School managers and teachers have the autonomy to make key decisions such as curriculum adjustments to the school context, selection of contents that are relevant for their students, and usage of EdTech tools that are more appropriate for their specific situation.

Estonia is also one of the most digitized societies in the world, with a large number of public services available to citizens online. At the education level, the Ministry has been investing in digital capacities and infrastructure for several years and aims to effectively implement modern technologies in learning, teaching, and research to ensure that every student is equipped with the necessary knowledge and skills. Due to this expertise and institutional capacity, during the COVID-19 pandemic, Estonia's education system was in a position to react rapidly and transition to remote learning. Two days after the announcement of school closures, all educational institutions, with the exception of kindergartens, started applying digital learning solutions.

Estonia has also been supporting teachers for several years to equip them with the tools needed to integrate digital technologies into their teaching practice. Teacher education programs focused on the usage of digital technologies for education were already present before COVID-19 and effectively executed by Ministry's partner organizations such as HITSA. For example, the training portal Koolitus was developed so that teachers could practice how to enhance the creativity of students by using digital tools.

Source: Remote learning during the global school lockdown: multi-country lessons, 2021.

While leveraging institutional capacities and expertise gained before the ETRI evaluation is critical to strengthen HCMC's overall EdTech strategy, equally important is to continually monitor and evaluate education processes and outcomes to understand if the whole remote education strategy is effective to reach all students, sustain learning engagement, and increase learning outcomes.

REFLECTION (SCHOOL MANAGEMENT) FOR HCMC'S POLICYMAKERS

Q7: How can HCMC education policymakers translate the strong perception of school management policies into more effective practices, making sure that strategic plans are implemented in schools?

8. INEQUALITIES - KEEP WORKING TOWARD BRIDGING THE URBAN AND RURAL DIVIDE

Minor differences are documented when comparing EdTech policies and practices between urban and rural/peri-urban areas. This is a positive result in terms of integration and coherence within HCMC; though the few differences across location may be because HCMC's population is highly concentrated in urban areas. If this analysis had been conducted in the country as a whole, results could be different as Vietnam's rural population is over 60 percent.

As HCMC continues to progress and invest in EdTech, future actions can be considered to bridge the urban and rural divide and avoid its increase. Currently, more principals at urban schools believe there is a strategy for connectivity and digital resources at their schools and report having participated in training sessions, a strategy that could be strengthened in rural/peri-urban areas. For example, in Estonia, to ensure all students could access online learning solutions, the government allocated a supplementary budget for high-speed Internet in rural areas during the COVID-19 pandemic, and schools lent their computers to students in most need.

The digital divide in education goes beyond the issue of access to devices and connectivity in urban and rural areas. In HCMC, teachers in rural/peri-urban schools have lower confidence in the ability of students to perform ICT related activities without assistance (e.g. revisiting websites, information validation), suggesting that guidance and capacity-building are required for rural areas. The divide that requires more effort to bridge separates those students and teachers with the skills to benefit from the use of digital technologies from those without the skills. An emphasis in teachers and students could be not only on the devices and connectivity, but on the use of effective digital pedagogies.

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