

Technology-Enabled Innovation in Education in Southeast Asia (TIESEA)

Diagnostic Assessment Report – Viet Nam Country Report

March 2022



Learning Possibilities

**This Report presents preliminary findings and an official ADB
publication will be produced in due time**

**TECHNOLOGY- ENABLED INNOVATION IN EDUCATION IN SOUTHEAST
ASIA (TIESEA) – EDTECH DIAGNOSTICS AND INTERVENTIONS SUPPORT**

DIAGNOSTIC ASSESSMENT REPORT – VIET NAM COUNTRY REPORT

TA-6671 REG - CONTRACT N° 167252-S53987

March 2022

The views expressed in this publication are those of the authors and do not necessarily reflect the views and policies of the Asian Development Bank (ADB) or its Board of Governors or the governments they represent.

TABLE OF CONTENTS

ABBREVIATIONS	2
EXECUTIVE SUMMARY	3
1. THE EDTECH READINESS ASSESSMENT FRAMEWORK	7
2. APPLYING THE EDTECH READINESS ASSESSMENT FRAMEWORK TO VIET NAM	9
Infrastructure	9
Government.....	11
Schools / Teachers.....	14
Students / Parents.....	18
Providers – Companies and Public Private Partnerships	20
3. KEY FINDINGS AND RECOMMENDED INTERVENTIONS	25
REFERENCES	27
ANNEXES	32
Annex 1: Inventory of EdTech providers	32
Annex 2: Survey findings – Viet Nam.....	39
Annex 3: Report on gender gap in EdTech in Viet Nam	45

ABBREVIATIONS

AI	Artificial Intelligence
ALEKS	Assessment and Learning in Knowledge Spaces
ASEAN	Association of Southeast Asian Nations
CMS	Content Management System
DERF	Digital Education Readiness Framework
DKAP	Digital Kids Asia Pacific
DOET	Departments of Education and Training
DX	Digital Transformation
EC	European Council
ETEP	Elementary Teacher Education Program
GDVT	General Department of Vocational Training
GIZ	General Appropriations Act
GO	Government
GSO	General Statistics Office
IF	Infrastructure
ILO	International Labour Organization
IT	Information Technology
LMS	Learning Management System
MOET	Ministry of Education and Training
MOS	Microsoft Office Specialist
MS	Microsoft
MSME	Micro, Small and Medium Enterprises
OMO	Online-merge-Offline
PAR	Participatory Action Research
PPP	Public Private Partnership
PR	Providers
SME	Small And Medium Enterprises
SP	Student/Parents
ST	Student/Teachers
STEM	Science, Technology, Engineering, and Mathematics
UNESCO	United Nations Educational, Scientific and Cultural Organisation
UNICEF	United Nations International Children's Emergency Fund
US	United States

EXECUTIVE SUMMARY

Viet Nam's K-12 sector consists of more than 15.8 million students (8 million in primary, 5.3 million in lower secondary, and 2.5 million in upper secondary) General education (grade 1-12) has undergone significant reform in recent years. For instance, a new competency-based curriculum has replaced conventional delivery based on a single set of textbooks, and attempts to integrate STEM/STEAM into the curriculum have put strong emphasis on innovative pedagogy. Gender disparities exist in Viet Nam, but they are shrinking (see Annex 3) currently more girls than boys are enrolling for upper secondary education and the graduation rate for Bachelors degrees has reached gender parity Women, in general, are earning about 10% less than men for equivalent work.

Based on the five pillars of the ADB EdTech Readiness Framework, this report describes the current situation of education in Viet Nam in general, with a specific focus on how EdTech is being implemented to improve the quality of teaching and learning. The five pillars of the framework include infrastructure, government, schools/teachers, parents/students, and EdTech providers. By identifying the existing status of EdTech readiness in Viet Nam using this framework, the report seeks to provide evidence against which decision-makers can identify initiatives likely to make a positive contribution to the quality of the education ecosystem and opportunities for public-private partnerships.

Infrastructure

According to World Bank report as cited in EdTech in SouthEast Asia (2020), 99.4% of total population in Viet Nam have had access to electricity as of 2019.

In January 2021, the Internet penetration in Viet Nam was 70.3%, which was higher than the average ratio of 69% in the South-East Asia region. However, the Internet speeds are slow compared to many of its peers. The average broadband download speed was only 7.02 megabytes per second, 10 times slower than Singapore at 70.86 Mbps Though on mobile networks the download speed was 34.51 Mbps¹. The number of mobile connections in Viet Nam in January 2021 was equivalent 157.9% of the total population to 157.9% of the total population, also higher than the average rate of 132% in South-East Asia countries (Kemp, 2021). Nonetheless, there some severe limitations, Mobile broadband, despite reportedly covering most of the country, is hardly workable in many areas. Many people struggle with unstable communication even in the centre of Hà Nội,². Viet Nam ranked high in terms of internet affordability as it only takes 62 seconds to access the cheapest mobile internet and 184 minutes to access the cheapest broadband internet, the report stated. Viet Nam also ranked 59th in terms of electronic security as data protection laws in Viet Nam are said to be "very low".

The number of smartphone users from 15 years old is 53.5 million, accounting for 84.6% of the total number of phone users aged 15 years upwards.; 66.1% of this group own laptop or desktop computers, 31.9% have tablet devices³.

Before COVID-19 pandemic, the TV or radio broadcasting for education was not really popular. A national education TV channel was officially launched in 2016 to promote the learning spirit in the society. The channel originally focused on additional and supporting information rather than the core content; from early 2020, usage increased dramatically due to the COVID-19 pandemic-related school closure. Students can access either the national / provincial TV stations websites for detailed schedules or their official YouTube channel to join the broadcasting content.

¹ Nguyen, 2020

² Thanh Thuy, 2021

³ Kemp, 2021

Government

Educational expenditure in Viet Nam is high (ca. 6% of GDP). This accounts for approximately 20 per cent of the total State budgetary expenditure, and will continue to increase. Private and foreign investment in education is also encouraged. The country also encourages private and foreign investment in education. The Government views digital transformation across the broader economy as critical to continued growth and prosperity. At the moment, multiple agencies are charged with supporting and regulating different aspects of the digital economy in Viet Nam. The current regulatory framework consists of commercial regulations and decrees issued by various ministries. Currently, for telecommunications and ICT industry-related issues, the Ministry of Information and Communication is the main agency⁴. Despite the government's clear commitment the definition of EdTech still remains a vague area under the Viet Nameese legal framework since it has not been explicitly specified in legal documents. From 2010s, the Viet Nameese Government's projects to develop EdTech, however have been mainly small scale subject-based projects with limited objectives, mostly in public schools⁵.

Policymakers have strongly focused on renovating education, in the first place as a strategy to respond to the demand of the global knowledge society for qualified human resources. Guidelines from the MOET to provincial DOETs encourage educators to apply ICT in education practice. E-learning and the development and use of e-lessons is put forward as the ultimate outcome of integration of ICT in education.

The MoET is focused on the EMIS - Education Management Information System to improve the data and management. It plans shortly to approve the Circular on Digital Database Management of Education and Training, the final step on completing national EMIS In December 2021.

EdTech integration in training pre-service teachers is still rather limited. The EdTech skills of the trainers and lecturers in pre-service teacher training establishment vary widely and there is, therefore, a great inconsistency in the application of EdTech pre-service teacher education and training. Although EdTech integration is recognised to be of great value by the educators equipment, infrastructure as well as the low levels of advanced digital literacy combine to reduce its manifestation in practice. Significant investment is required if the aspirations of EdTech integration are to be realized for trainee teachers.

School/teachers

Before the COVID-19 pandemic, the training for in-service teachers on improving digital literacy was a low priority for the MoET. Vinh, Le et al (2019) in the Viet Nam country report for UNESCO Bangkok's "Digital Kids Asia Pacific (DKAP)" project for 20 schools in 5 provinces of Viet Nam found that the rate of PreK-12 teachers who can apply ICT to enhance teaching methods in the class is about 76% while only 28% of teachers have the ability to design the e-Learning lecture.

According to MOET's report on the Digital Transformation in Viet Nam Education: Status and Solutions in 2021, there are nearly 1.4 million teachers and education managers, hence, to conduct the digital transformation, it will be an enormous challenge with several issues that need to be solved including consistent systems and changing mindset from leadership to teachers and students.

⁴ Le & Tran, 2020

⁵ Acclime, 2021

There are dozens of online platforms and offline EdTech tools available to teachers in Viet Nam. They are summarised here under five key categories, with a few examples of international platforms and available tools provided below. (A full inventory of EdTech providers is available at Annex 1)

Since 2015, the Government of Viet Nam has issued many decisions and circulars guiding distance learning on the online training system⁶. In 2020, in response to COVID-19 pandemic, the Government had immediately issued a national plan for digital transformation⁷. To accompany and support the transformation the MoET issued supporting documents on distance and online learning⁸.

Traditionally, the schools/ teachers have communicated with parents by the “So lien lac” - Communication notebooks. There, teachers will report on single students’ situations and reminders weekly. For urgent cases, teachers and parents can phone and set up school-parent meetings. During the COVID-19 pandemic, the news has significantly changed daily including opening-closing schools as well as preparation for stay-at-home learning. Therefore, teachers and parents resorted to social media with Zalo being one of the most popular instant messaging applications.

Home students/parents

In Viet Nam, computer literacy is still an unaffordable luxury for most children, especially in the rural areas. In most schools, there are no computers for students to learn basic computer skills. Yet young people in Viet Nam see digital literacy as important for their future. Child safety online is an issue with cyber bullying a particular risk. More than 70% of Viet Nameese children aged 8 to 12 are facing cyber risks. Nonetheless, the transition to online teaching and learning seems inevitable in this day and age. The requirement to move to online education due to the COVID- 19 pandemic has exposed the digital divide in the region, between the children who have access to digital learning opportunities and those who do not. According Online Management Training Company, a recent assessment at 500 preschools in Viet Nam by KidsOnline showed a significant gap in readiness, digital skills, facilities, infrastructure, and learning materials in ethnic minority languages in preschool education.

During the COVID-19 pandemic the MoET and the Ministry of Information and Community officially launched the “Connection and Computer for Students” program. The program focused on: internet for all households, computers for all poor students especially who are living in the COVID-19 affected areas, and reasonable internet prices for those students so “no students will be left behind”. But it is reported that nearly 2 million students lack devices for online learning.

Providers – Companies and Public Private Partnerships

According to the Government's orientation, the digital transformation in education with a vision to 2025 will bring teaching and learning in the digital environment by 50%; forming several online teaching and learning platforms that are domestic products and used by more than 50% of students; forming a national online repository of learning materials to meet the requirements of learning materials for 50%

⁶ Decision 1559/QD-TTg; Decision 117/QD-TTg

⁷ Decision 749/QD- TTg (3 June 2020) Approval on National digital transformation plan till 2025, heading to 2030.

⁸ Circular 09/2021/TT-BGDĐT (30 March 2021) Regulation in management and organizing online classes for K-12 and continuing education centres. This document has officially encouraged blended learning for both faces to face and online learning, as well as detailed guidelines to manage the online classes for all K-12 schools.

Decision 4919_QD_BGDDT (31 December 2020): Approval on the ICT application and development to Digital Government and ensure the information security of MoET in the period from 2021-2025.

Document 4096BGDDĐT-CNTT (20 September 2021) Guidelines on ICT application and education management in the school year 2021-2022.

of the contents for the general education program; more than 50% of higher education institutions offer distance learning (degree) programs. Several projects exist with international not-for-profit partners including, for example: The Education Commission; UNICEF; ASEAN and the Secdev Foundation. Elearning systems are dominated by the international players such Google and Microsoft Education and by major national companies such as Classin and Galaxy Education's HOCMAI platform. Content providers include SMAS, Bachkim, Hoola, Edu box, Sunbot and Hương Việt Elearning. School administration systems that support online teaching and integrate with email users' phone numbers are also popular in schools in Viet Nam, such as kidsonline, oneEdu, etc. Construction support tools other lectures such as Adobe presenter, Ispring suite, etc., and other supporting tools such as Test Bank, Azota, etc. New technologies applying AI and VR/AR in Viet Nam's market today are mainly developed by large technology companies that can integrate or support online training systems, including monitoring systems. Online exams with AI proctors like Examus, lab simulation lectures for K12 with VR/AR technology like ScholAR or 3D lab simulators like PhET, Openclassroom, etc.

1. THE EDTECH READINESS ASSESSMENT FRAMEWORK

This study was undertaken to analyze the Education Technology (EdTech) readiness of Viet Nam in each of the five areas – also called pillars - of the Digital Education Readiness Framework (DERF) framework. The overview of each pillar of DERF contributes to a holistic understanding of the EdTech readiness of Viet Nam, and would assist this Project to identify appropriate interventions to be implemented in 2022. This study will allow the ADB to fund EdTech interventions that can contribute to improving the quality of learning and teaching and schools in Viet Nam using the affordances of appropriate EdTechs. The ADB is the target audience as well as relevant government officials.

The ADB's Education Sector Group has developed the EdTech Readiness Assessment Framework as a tool to assess the current state of EdTech in the general education sector. The framework has five pillars as described below:

- 1. Infrastructure:** This pillar focuses on the current status of the ICT Infrastructure to support education, including its availability, accessibility, quality of services, and affordability. Four key components are assessed, including 1) power/electricity access, 2) telephony and internet connectivity, 3) devices and 4) broadcasting.
- 2. Government:** This pillar assesses the current situation of government policies and action plans that support the utilization of EdTech in enhancing educational outcomes. It relates to 1) policies and funding, 2) ICT integration in the curriculum, 3) education performance measurement, and 4) pre-service teacher training.
- 3. Schools/teachers:** This describes the capacity of school teachers and administrators to optimize the use of EdTech in teaching and learning. There are four key areas studied including 1) teacher capacity building in EdTech (in-service training), 2) equipment & software in schools, 3) governance (school policies, budget, monitoring for quality learning outcomes), as well as 4) community outreach.
- 4. Parents/students:** This pillar describes the home or community environment that enables or facilitates the use of EdTech to improve student learning outcomes. Again, there are four components including: 1) students' digital literacy, 2) home connectivity and availability of devices, 3) online access to curriculum content, and 4) community support.
- 5. Providers:** The last pillar shares insights on current EdTech providers and education public-private partnerships (PPP). It included a review of 1) the current situation of PPP each country 2) learning management / eLearning systems and their online contents, and 3) emerging technology developers.

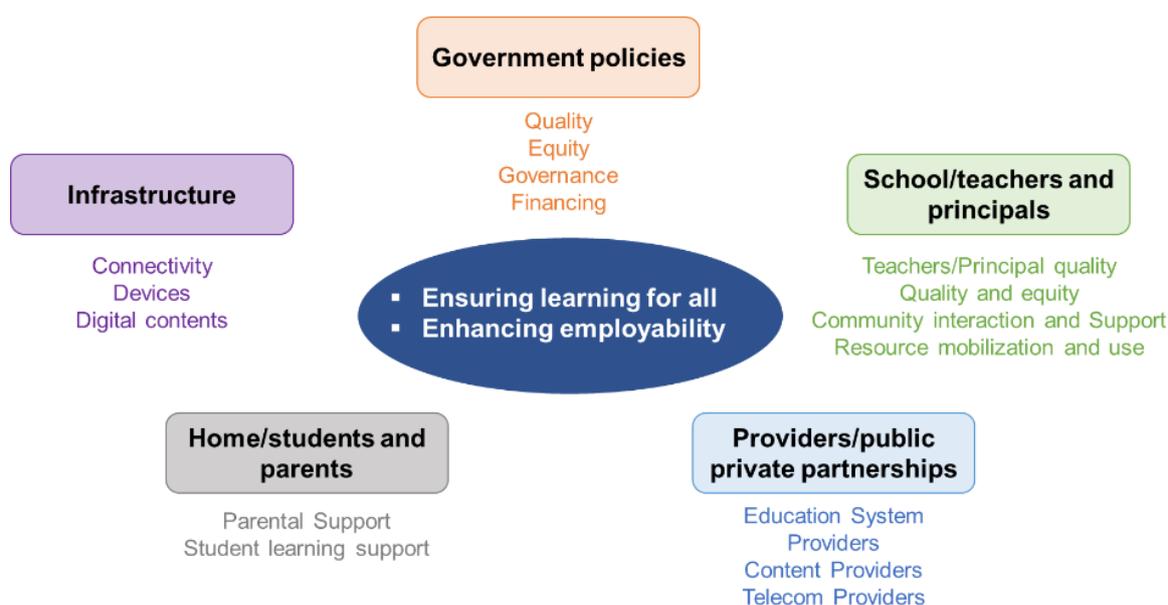


Figure 1: The EdTech Readiness Framework – Five Pillars of the EdTech Assessment for a Country
(Source: ADB)

The key components of the DERF domains and sub-domains are detailed as follows:

Domain / Sub-domain	PILLAR 1 Infrastructure	PILLAR 2 Government	PILLAR 3 Schools/ Teachers	PILLAR 4 Students/ Parents	PILLAR 5 Providers
1	IF1 (power, electricity access)	GO1 (policy / funding)	ST1 (teacher capacity in edtech)	SP1 (digital literacy of students)	PR1 (partners, sponsors)
2	IF 2 (telephony, internet connectivity, user stats)	GO2 (curriculum and content)	ST2 (equipment and software)	SP2 (connectivity and devices at home)	PR2 (e-learning systems)
3	IF3 (devices and hardware)	GO3 (education performance measurement)	ST3 (governance)	SP3 (online access to curriculum content)	PR3 (online content)
4	IF4 (TV/radio broadcasting)	GO4 (training)	ST4 (community outreach)	SP4 (community support)	PR4 (integrators, emerging tech)

Table 1: Key Components in each Domain

2. APPLYING THE EDTECH READINESS ASSESSMENT FRAMEWORK TO VIET NAM

This country report describes the current situation of education in Viet Nam based on the above-mentioned five pillars of the EdTech Readiness Framework.

Infrastructure

IF1 (power, electricity access)	The national electricity infrastructure and issues/challenges that schools and learners may have regarding access to electricity.
IF2 (telephony, internet connectivity, user stats)	Telecommunication access and internet connectivity - issues, challenges availability, etc.
IF3 (devices and hardware)	The national level availability of ICT devices that are related to edtech - availability, costs, maintenance, providers.
IF4 (TV/radio broadcasting)	Broadcasting methods, content creation and transmission, how it supports curriculum delivery and attainment of learning outcomes.

IF1 Power and Electricity Access

According to World Bank report as cited in EdTech in SouthEast Asia (2020), 99.4% of total population in Viet Nam have had access to electricity as of 2019.

Electricity	<ul style="list-style-type: none"> ▪ Since 2017, Vietnam's entire population has been able to get access to electricity due to the government's Rural Electrification Program, which utilized international donor and commercial bank loans to connect 82m homes in poor and rural areas to the national grid in under 20 years. ▪ Rapid urbanization and industrialization have caused urgent challenges with unsustainable electricity and water supply, waste management and pollution.
--------------------	--

Table 2: Electricity access in Viet Nam (Source: EdTech in Southeast Asia - 2020)

In the age of IR4.0 (the Fourth Industrial Revolution (IR4.0)), electricity must be upgraded. The supply of electricity needed to be stable, adequate and regular⁹.

IF 2 Telephony and internet connectivity

Internet services officially became available in Viet Nam in 1997. Since then, the internet has penetrated and influenced all areas of life as well as the education sector.

Viet Nam gained around 45 million new mobile internet subscribers from 2010 to 2019, or 46 percent of the population. Viet Nam's percentage increase is the highest in the region, and Internet penetration in Viet Nam stood at 70.3% in January 2021, which was higher than the average rate of 69% in South-East Asia region¹⁰.

Whilst mobile wireless connectivity has been growing so quickly, fixed broadband connections have expanded more slowly and more recently, but only three countries among Viet Nam's 12 ASEAN peers have more subscriptions per population today. Meanwhile, mobile connectivity has exploded, and there

⁹ Viet Nam Ministry of Industry and Trade & UNDP, 2019

¹⁰ Kemp, 2021

are now significantly more mobile phone subscriptions than people in Viet Nam¹¹. The cost of using internet is at a moderate level. Fixed broadband internet service charges in Viet Nam are among the lowest in Asia Pacific¹².

However, the Internet speeds are slow compared to many of its peers. The average broadband download speed was only 7.02 megabytes per second, 10 times slower than Singapore at 70.86 Mbps. Though on mobile networks the download speed was 34.51 Mbps¹³.

Mobile connections in Viet Nam

There were 154.4 million mobile connections in Viet Nam in January 2021, and the number of mobile connections in Viet Nam increased by 1.3 million (+0.9%) between January 2020 and January 2021. The number of mobile connections in Viet Nam in January 2021 was equivalent 157.9% of the total population to 157.9% of the total population, also higher than the average rate of 132% in South-East Asia countries (Kemp, 2021). Nonetheless, there some severe limitations, Mobile broadband, despite reportedly covering most of the country, is hardly workable in many areas. Many people struggle with unstable communication even in the centre of Hà Nội,¹⁴. Among Internet users aged 16 to 64 years old, the most popular mobile apps were chat (Messenger) with 94.7% users, followed by social networking apps with 94.5% and entertainment and video apps with 83.4%. The most popular online activities were watching online videos (97.6%), listening to music streaming services (73.2%) and watching vlogs (61.2%).

There were 72.00 million social media users in Viet Nam in January 2021 and the number of social media users in Viet Nam increased by 7.0 million (+11%) between 2020 and 2021. The number of social media users in Viet Nam was equivalent to 73.7% of the total population in January 2021, higher than the average rate of 69% in South-East Asia region¹⁵.

Online privacy and wellbeing: relatively secure, but little privacy and protection against market concentration and censorship

A recent global report on digital quality of life¹⁶ placed Viet Nam at 54th out of 85 economies and 15th in Asia, surpassing many of its neighbors. Viet Nam scored an average of 0.5 on a scale of 1 and is ahead of many Southeast Asian neighbors like Thailand (63rd), the Philippines (66th) and Indonesia (71st), according to a report released by Surfshark, a virtual private network service based in the British Virgin Islands. In Southeast Asia, Viet Nam lies behind Singapore (12) and Malaysia (41). The report ranked 85 countries and territories based on five fundamental pillars that define the digital quality of life: internet quality, affordability, e-security, online government services and e-infrastructure. There are small gender differences in access to technology, though women's access and share of online information sites is, typically, about 10% lower the men's. Access and availability to technology tracks more significantly to socio-economic status than it does to gender.

Viet Nam ranked high in terms of internet affordability as it only takes 62 seconds to access the cheapest mobile internet and 184 minutes to access the cheapest broadband internet, the report stated. Viet Nam also ranked 59th in terms of electronic security as data protection laws in Viet Nam are said to be "very low".

¹¹ World Bank, 2021

¹² Le & Tran, 2020; World Bank, 2021

¹³ Nguyen, 2020

¹⁴ Thanh Thuy, 2021

¹⁵ Kemp, 2021

¹⁶ Nguyen, 2020

IF3 Devices and Hardware

Device ownership

The Ministry of Information and Communications promulgates Circular No. 43/2020 on national technical regulations on terminal devices of terrestrial mobile communication - Radio Access Network", regulating mobile devices manufacturing and importing into Viet Nam must support 4G or higher technology from July 1, 2021. From January 2022, the old 2G and 3G systems were officially discontinued.

By the end of September 2021, there were 123 million subscribers in Viet Nam, of which smartphone subscribers reached 90.3 million, accounting for 73.4% of mobile subscribers, increased by 9.03% over the same period last year.

The number of smartphone users from 15 years old is 53.5 million, accounting for 84.6% of the total number of phone users aged 15 years upwards.

While 66.1% of this group own laptop or desktop computers, 31.9% have tablet devices¹⁷.

IF4 TV/radio broadcasting

Before COVID-19 pandemic, the TV or radio broadcasting for education was not really popular. There used to be some supporting sessions but they did not catch much attention from both schools and students. A national education TV channel was officially launched in 2016 to promote the learning spirit in the society. The channel originally focused on additional and supporting information rather than the core content but it was not until early 2020 that the channel started to receive the students' attention, as the COVID-19 pandemic began to sweep the world, leading to the closure of many schools and academic establishments from January. The MOET responded quickly to try to ensure academic continuity as well as the fairness and validity of the school's exams under the compulsory stay-at-home situation. Hoang and others (2020) have reported that the broadcasting teaching sessions have addressed several issues: digital divide, students' engagement with online learning, regional differences.

Students can access either the national / provincial TV stations websites for detailed schedules or their official YouTube channel to join the broadcasting content.

Government

GO1 (Policy /funding)	ICT related policies, plans and funding at the national level - implementation, limitations, challenges, etc.
GO2 (Curriculum and content)	The state of integration of edtech in the national curriculum to support learning outcomes (limitations and gaps).
GO3 (Education performance measurement)	ICT used to collect and analyze key system performance data (systems, processes, issues, challenges, gaps).
GO4 (Training)	ICT pedagogy integration in pre-service teacher education

GO1 policy / funding

National Digital Transformation Programme by 2025, with an orientation towards 2030

Viet Nam recently approved the National Digital Transformation Programme by 2025, with an orientation towards 2030. The initiative is designed to help accelerate digital transformation through changes in

¹⁷ Kemp, 2021

awareness, enterprise strategies, and incentives towards the digitalization of businesses, administration, and production activities. The programme will target businesses, cooperatives, and business households that want to adopt digital transformation to improve their production, business efficiency, and competitiveness¹⁸.

Digital transformation has also been prioritized in eight sectors which include finance and banking, healthcare, education, agriculture, transport, logistics, energy, natural resources, and environment and manufacturing¹⁹.

The Viet Nam Government views digital transformation across the broader economy as critical to continued growth and prosperity. At the moment, multiple agencies are charged with supporting and regulating different aspects of the digital economy in Viet Nam. The current regulatory framework consists of commercial regulations and decrees issued by various ministries. Currently, for telecommunications and ICT industry-related issues, the Ministry of Information and Communication is the main agency²⁰.

Barriers and challenges in ICT-related issues

There are two major policy and implementation gaps limit Viet Nam's regulatory effectiveness.

First, the lack of a consolidated framework legislation dealing with the digital technologies has led to piecemeal rulemaking, including the proliferation of about a dozen circulars issued by the Ministry of Finance stipulating fees for accessing various datasets such as land data, environment, remote sensing, or mapping data. In a digital era when data including digital maps and satellite imagery are considered the new production factor, the treatment of this new production factor as secret is unnecessarily restrictive and will inhibit seamless digital data flows among government agencies. This will affect the ability of governments at all levels to make informed and timely decisions, especially in areas of urbanization and environmental pollution.

Second, robust policy implementation is needed. As an example, Prime Minister Decision 1660/ QD-TTg dated October 2020 on classified documents of the natural resources and environment sector has been followed by only limited progress on the ground.

The institutional framework for digital transformation in Viet Nam is overly complex. The government strengthened its National Steering Committee for digital government and the digital economy in late 2019, with the prime minister chairing the committee. This is mirrored at the provincial level, where the chairperson of the provincial People's Committee heads the steering committee. However, at the operational level major tasks on the digital transformation agenda are dispersed across at least seven ministries, making coordination and implementation of policies and programs challenging. For instance, this has led to key national registries—including land, citizens, enterprises, and civil—being collected and managed by different agencies²¹.

Another challenge of digital transformation is lack of coordination of different public agencies in implementation national digital economy strategies. For example, while Viet Nam Customs and the Ministry of Finance have been working together on a payment system for collecting customs duties and electronic taxation, there have been no efforts to align this with the government's overarching digital economy strategy. The main reason for the lack of coordination is the absence of political leadership on digital economy issues. While the Ministry of Information and Communications' Digital Economy Agency has recently been given the responsibility of drafting guidelines to propose an implementation plan, without the endorsement and commitment from higher levels: namely, at the level of deputy prime

¹⁸ Samuel, 2021

¹⁹ <http://asemconnectvietnam.gov.vn/>, 2021

²⁰ Le & Tran, 2020

²¹ World Bank, 2021

minister or prime minister, and the designation of a coordinating taskforce, the plans are likely to go unrealized²².

Government's EdTech-related policies, plans and funding

Viet Nam is known for its significant spending on education (ca. 6% of GDP), as Viet Nameese culture places a high value on education²³. This accounts for approximately 20 per cent of the total State budgetary expenditure, and will continue to increase. Private and foreign investment in education is also encouraged. The government allows foreign investors to set up and own up to 100 per cent of education institutions. The Government of Viet Nam's commitment to EdTech and has demonstrated this through many policies, and master plans over the past decade or more.

In practice, Viet Nam has a complex and diverse classification of the educational system, including Kindergarten, general education with primary, junior, and high school, vocational education, university and post-university programs. Besides that, to meet the needs of today's economic and social development, many short-term courses on soft or life skills, national or international practicing certificate, or certificates for foreign languages have become popular. Despite the government's clear commitment the definition of EdTech still remains a vague area under the Viet Nameese legal framework since it has not been explicitly specified in legal documents. From 2010s, the Viet Nameese Government's projects to develop EdTech, however have been mainly small scale subject-based projects with limited objectives, mostly in public schools²⁴.

GO2 Curriculum and Content

For more than ten years in Viet Nam, ICT has been seen by the Ministry of Education and Training (MoET) to be of critical importance in the education both as an object of education as well as an important pedagogical tool for innovating teaching methodology. During the school year 2008-2009, the Ministry launched the "Year of ICT" to promote the expansion of the use of technology both as subject discipline and as a tool. Policy makers have strongly focused on renovating education, in the first place as a strategy to respond to the demand of the global knowledge society for qualified human resources. Guidelines from the MOET to provincial DOETs encourage educators to apply ICT in education practice. E-learning and the development and use of e-lessons is put forward as the ultimate outcome of integration of ICT in education.

At the same time the government has worked to create a skilled workforce by improving the vocational training in the country. The General Department of Vocational Training (GDVT) runs 455 schools and colleges and more than 800 vocational training centers across Viet Nam to further their goal.

GDVT wants to equip Viet Nameese students with skills to compete globally in the workplace by showing them the value of the courses they offer and increasing enrollment in vocational training schools and colleges. In particular, GDVT recognizes that all students need digital literacy skills, and they want to adopt the best solution to measure the basic technology skills of their students as part of the country's annual skill examinations.

IIG Viet Nam proposed the Certiport Internet and Digital Literacy Certification (IC3) program as a solution to overcome the digital literacy challenges in vocational schools and colleges in Viet Nam. In order to build a strong foundation with qualified teachers. IIG Viet Nam started by conducting training to certify teachers on their digital literacy skills at their offices in Hanoi, Ho Chi Minh City, and Danang.

Several pilot programs at vocational schools and colleges all over Viet Nam have been run to accurately measure the effectiveness of IC3. Several testing locations faced Internet access challenges and low

²² World Bank, 2018 as cited by (Le & Tran, 2020)

²³ Bozhok, 2021

²⁴ Acclime, 2021

bandwidth. The Certiport team provided a special technology solution to overcome the Internet connectivity and other on-site issues and facilitate online exam delivery.

GO3 Education Performance Measurement

Before COVID-19 pandemic, the EMIS - Education Management Information System was the main focus of the MoET to improve the data and management. According to Ngoc. T(2004), EMIS was piloted into the Education sector since 2003 and up to the reported time, all provincial Departments of Education and Training (DOET) were using the EMIS at different levels and scales into education and information management. EMIS was also one of the European Council (EC)'s sponsored projects up to 7.6 million euros for the Viet Nam Education sector.

In December 2021, ETEP Program under MoET also conducted training sessions to share and guide on the usage of 9 modules about “ICT application for data management in K-12 schools” for more than 300 core teachers and managers. Some provinces have its unified EMIS across the province, like Ho Chi Minh City²⁵.

Some private IT Groups have already introduced their EMIS to many schools like Viettel, VNPT, Quang Ich (<https://quangich.com/quanlygiaoduc>), MISA (<https://emis.misa.vn/>).

GO4 Training

EdTech pedagogy integration in pre- service teacher education

EdTech integration in training pre-service teachers is still rather limited. The EdTech skills of the trainers and lecturers in pre-service teacher training establishment vary widely and there is, therefore, a great inconsistency in the application of EdTech pre-service teacher education and training. Although EdTech integration is recognised to be of great value by the educators equipment, infrastructure as well as the low levels of advanced digital literacy combine to reduce its manifestation in practice. Significant investment is required if the aspirations of EdTech integration are to be realized for trainee teachers. Whilst there is gender parity in most phases of education, women are significantly under-represented in post-graduate education. In the education workforce women’s prevalence is mostly in relation to pre-school and early years provision and progressively less so, in the education sector, from the primary to tertiary phases.

More generally, in the population, Viet Nam is seriously lagging its main competitors in the region in terms of digital skills. The available pool of skilled workers currently falls short of what is required for a rapid digital transformation. It is estimated that the economy could lose as many as two million jobs by 2045. Therefore, the digital transformation could lead to the replacement of labour by digital capital, reducing overall gains for the economy, and creating significant inequalities that could in turn generate economic and social tensions²⁶.

Schools / Teachers

ST1 (teacher capacity in edtech)	Teachers' digital literacy and the description of training support provided to teachers in improving their digital literacy skills at the school level (gaps/issues).
ST2 (equipment and software)	Types of technology support provided by school to admin staff, teachers and students (issues/challenges/concerns/gaps).

²⁵ <https://truong.hcm.edu.vn/Login.aspx?returnUrl=~/default.aspx>

²⁶ Morisset, 2021

ST3 (governance)	The policies, budget and monitoring process and/or tools (differences/gaps across schools)
ST4 (community outreach)	How schools/teachers use ICT to communicate with parents/students/community: tools they use, issues they discuss (differences/gaps).

ST1 Teacher Capacity in Edtech

Before the COVID-19 pandemic, the training for in-service teachers on improving digital literacy was a low priority for the MoET. Vinh, Le et al (2019) in the Viet Nam country report for UNESCO Bangkok's "Digital Kids Asia Pacific (DKAP)" project for 20 schools in 5 provinces of Viet Nam found that the rate of PreK-12 teachers who can apply ICT to enhance teaching methods in the class is about 76% while only 28% of teachers have the ability to design the e-Learning lecture.

- MOET is also promoting for the e-learning content resources: <http://elearning.moet.edu.vn>
- MOET is promoting its e-learning system: <https://eitsc.edu.vn> which is reported to be synced with Google Meet, MS Team and Zoom.
- There are four main focusing ICT application targets for the school year: (1) Applying ICT in educational administration and management activities, (2) Applying ICT to support innovation in content, teaching, learning, examination and assessment methods, (3) Strengthening infrastructure and equipment IT equipment, and (4) Fostering IT/Digital skills for teachers and educational administrators.

To enhance teachers' digital skills and confidence for the school year 2021-2022, from September 1st to 12th, 2021, the Ho Chi Minh University of Education organized to several meetings with K-12 teachers across provinces to understand better teachers' demand and expectation as well as propose the detailed plans, tools/applications and free trainings for teachers²⁷.

According to the evaluation results from ETEP - the MOET's Enhancing Teacher Education Program on 7 January 2022, among 56,517/59,000 principals and vice-principals on the TEMIS system as of December 31, 2021, the content that mostly wanted to be trained are: Using foreign languages; Guidelines for the implementation of New Viet Nam National Curriculum since 2018; IT applications; Management of teaching and student education activities; Planning school development.

In most of the content, teachers expect to receive training during the summer break. The content that many teachers want to be fostered within the next 1 year include: Examination and assessment towards the development of student quality and capacity (26.4%); Develop teaching and educational plans in the direction of developing students' qualities and capacities (26.3%); Using teaching and educational methods towards developing students' quality and capacity (26.0% of opinions); Student counseling and support (25.9%); IT application and using of technological equipment in teaching and education (25.6% of opinions); Professional development (25.0%).

It is expected that MOET will then issue detailed plans to meet the teachers' training expectation in 2022.

In the private sector, there are several IT, education and consulting firms that have started IT competency training for years but mostly focusing on private schools or schools in big cities.

Microsoft Education has promoted the MOS - Microsoft Office Specialist certification and Microsoft Innovative Educator Expert program for years but strongly during the COVID-19 pandemic. Additionally Microsoft created the Innovative Educator Foundation (<https://vief.edu.vn>) to encourage teachers to innovate and apply EdTech in their teaching.

²⁷ Minh, 2021

According to MOET's report on the Digital Transformation in Viet Nam Education : Status and Solutions on 4 November 2021, there are nearly 1.4 million teachers and education managers, hence, to conduct the digital transformation, it will be an enormous challenge with several issues that need to be solved including consistent systems and changing mindset from leadership to teachers and students.

ST2 Equipment and Software

There are dozens of online platforms and offline EdTech tools available to teachers in Viet Nam. They are summarised here under five key categories, with a few examples of international platforms and available tools provided below. (A full inventory of EdTech providers is available at Annex 1)

1. Learning Management System (LMS)
 - K12 online
 - Blackboard
 - Edmodo
 - Google Classroom
2. Online interaction apps
 - Zoom
 - MS Teams
 - Google Meet
3. Presentation apps
 - Powerpoint
 - Google slides
 - Apple Keynote
4. Notes and Whiteboard apps
 - Screencastify
 - Google Jamboard
 - MS Whiteboard
5. Interactions, Practice and Assessment apps
 - Kahoot
 - Kahn Academy
 - Mindspark
 - Padlet

Apart from the generic, international products indicated above, in Viet Nam, there are several popular segments of EdTech such as:

1. **Early Childhood Education** (Sunbot, KidsOnline Kidsup, Monkey Junior, Kyna Kid, Kidtopi, Ky nang cho be, Touch English, etc.)
 - Sunbot: Steam lab for kindy. <http://sunbot.vn> - sunbotvietnam@gmail.com
 - Kidsup: Early education package, focus on Montessori and Soroban. <https://www.kidsup.net> - hello@kidsup.net
 - Monkey Junior: online English learning application - Mobile and tablet friendly. <https://www.monkeyjunior.vn>; monkeyxinchao@monkey.edu.vn
2. **K12 Education (One Edu, Wewiin, Edmicro, etc)**
 - Wewiin (Get JSC): providing and consulting for platform and digital content + investment in Edtech <https://wewiin.com> /Thankyou@wewiin.com
 - Edmicro: Well-round platform including LMS, online content and tutoring.
 - One Edu: Electronic contact book, <http://one.edu.vn/>, contact@conek.net,
3. **Universities & vocational training (Cohota,OSLA.....)**
 - Cohota: Online Teaching, Internal Coaching, Smart School; , support@cohota.com.

- OSLA: The study abroad counseling center certified by the New Zealand Department of Education and Immigration, <https://myosla.com/>, duong.mai@myosla.com
- Edunet: Online platform to provide and compare info for higher education institutes. <https://edunet.vn> /email: info@edunet.vn

4. **Workforce/ Upskill training (Agilearn; Codegym, CLS)**

- Agilearn: Leading digital training solution, providing Learning Management System, digitizing content, personalized courses <https://agilearn.vn/>
- Codegym: Modern programming training system, <https://codegym.vn/>, info@codegym.vn,
- CLS E-Learning: ALL-IN-ONE solution for corporate training, <https://cls.vn/>, alo@cls.vn.

6. **English language teaching (Ocean Edu, VUS, Ila)**

- Ocean Edu: International English Training System, <https://ocean.edu.vn/vi-VN/>, info@ocean.edu.vn,
- VUS: proud to become a global standard English training unit recognized by NEAS, <https://vus.edu.vn/>,
- Ila: English Training and Study Abroad Counseling Program, <https://ila.edu.vn/>, info@ilavietnam.edu.vn

ST3 Governance

The Government of Viet Nam encourages the application of information technology in education to enhance the skills of teachers and students in using information technology and improve the quality of teaching at the same time. There has been across-the-board use of school management systems and student management since the early years of the 21st century.

From 2010 to 2015, the Government of Viet Nam encouraged the development of training on an online platform (e-learning). With this incentive, most universities in Viet Nam have developed LMS systems with the commonly used Moodle core.

Since 2015, the Government of Viet Nam has issued many decisions and circulars guiding distance learning on the online training system²⁸. During this time, Topics online training systems were developed, contributing to training thousands of university students remotely every year. In addition, the Ministry of Education and Training also promulgated regulations on the IT capacity of lecturers to meet the requirements of IT skills in the new period. A number of IT application products in this period by big companies like Google or Microsoft also support educational institutions in Viet Nam under the introduction of the Ministry of Education and Training in school operation. In 2020, under the impact of COVID-19 pandemic, the Government of Viet Nam issued new policies on online training. Accordingly, the process of online teaching, online examination and international cooperation in online training is recognized²⁹. At the same time, bachelor's degree programs at universities are also allowed to train online, accounting for 30% of the total number of credits of the program. In addition to the mentioned policy, the Ministry of Education and Training has also introduced the MS Team product to the Departments of Education and used it for free in teaching at the K12 level during the COVID-19 pandemic.

Before COVID-19 pandemic, the Government issued several decisions to encourage distance and online learning³⁰ and the MoET has immediately issued a guidance document on implementation.

²⁸ Decision 1559/QĐ-TTg; Decision 117/QĐ-TTg

²⁹ September 2021/TT-BGDĐT

³⁰ Decision 1559/QĐ-TTg: (10 September 2015) Development of Distance Learning Phase 2015-2020.

Decision 117/QĐ-TTg: (25 January 2017): Approval on the Proposal of strengthening ICT application in managing and supporting teaching, learning and researching for better education quality in 2016-2020, heading to 2025.

In 2020, in response to COVID-19 pandemic, the Government had immediately issued a national plan for digital transformation³¹. To accompany and support the transformation the MoET issued supporting documents on distance and online learning³².

ST4 Community Outreach

Traditionally, the schools/ teachers will communicate with parents by the “So lien lac” - Communication notebooks. There, teachers will report on single students’ situations and reminders weekly. For urgent cases, teachers and parents can phone and set up school-parent meetings. However, it takes a lot of time for both as well as lack of prompt updates and solutions.

With the IT application encouragement, digital communication notes have become more popular. The Digital Notes could help to inform parents with academic results, studying issues and reminders, and necessary meetings or events at the school.

Some popular Digital Communication Notes are listed below:

- VNedu: <https://tracuu.vnedu.vn/so-lien-lac/>
- SMSEdu: <http://smsedu.smas.vn/User/Login?ReturnUrl=%2f> owned by Viettel.
- Vietschool: <http://nhapdiem.vn/m/module0/login/>
- eNetViet: <https://enetviet.com/>

During the COVID-19 pandemic, the news has significantly changed daily including opening-closing schools as well as preparation for stay-at-home learning. Therefore, teachers and parents demand for a quicker communication methodology. Zalo, one of the most popular communication local applications, owned by VNG Corporation, has been maximized to use for the communication between teachers and parents. Each class should have one Zalo Group so parents can be informed about COVID-19 prevention measures as well as schools/ learning updates. For older students, each subject by class would have a Zalo group to inform on subjects’ updates and many parents became somewhat overwhelmed with all teachers’ reminders³³.

Students / Parents

SP1 (digital literacy of students)	Students' digital literacy and the support they receive from parents/guardians (issues/gaps).
SP2 (connectivity and devices at home)	Students access to devices and internet connection and the support they receive from parents/guardians (issues/gaps).
SP3 (online access to curriculum content)	Availability and types content that assists students in reaching learning outcomes (as outlined in the national curriculum)
SP4 (community support)	The how local community supports students with access to devices, internet, elearning content and technical support (challenges, gaps).

³¹ Decision 749/QĐ- TTg (3 June 2020) Approval on National digital transformation plan till 2025, heading to 2030.

³² Circular 09/2021/TT-BGDĐT (30 March 2021) Regulation in management and organizing online classes for K-12 and continuing education centres. This document has officially encouraged blended learning for both faces to face and online learning, as well as detailed guidelines to manage the online classes for all K-12 schools.

Decision 4919_QĐ_BGDĐT (31 December 2020): Approval on the ICT application and development to Digital Government and ensure the information security of MoET in the period from 2021-2025.

Document 4096BGDĐT-CNTT (20 September 2021) Guidelines on ICT application and education management in the school year 2021-2022.

³³ Binh Minh, 2021

SP1 Digital Literacy of Students in Viet Nam

Young people in Viet Nam see digital literacy as important for their future but they don't necessarily feel they have developed the right skillset in this area. Moreover, young people with disability, living in remote, mountainous areas and those from ethnic minority are not perceiving digital education equally as their peers³⁴. Similarly a recent UNESCO report highlights need to strengthen digital citizenship education in Viet Nam: In Viet Nam, 1,051 youth (53% female) participated in the survey, divided equally between rural and urban residents. The survey tested knowledge on digital literacy, safety, participation, emotional intelligence, and creativity. The results showed that Viet Nam lags South Korea and Fiji in most areas³⁵.

A report from DQ Institute³⁶ summarizes children's safety when using, accessing online and digital citizenship skills. The report is based on a multinational study of 38,000 children aged 8 to 12 years old across 29 countries. According to the report, an average of 68% of Viet Nameese children aged 8 to 12 are facing one or more cyber risks such as bullying, online game addiction, fraud, and performing online sex acts when use online platforms. The most common cyber risk is bullying (60%), followed by online sexual acts (22%) and meeting strangers online (12%). More than 70% of Viet Nameese children aged 8 to 12 are facing cyber risks. The risk is significantly higher when adults let children use media on their phones.

In Viet Nam, computer literacy is still an unaffordable luxury for most children, especially in the rural areas. In most schools, there are no computers for students to learn basic computer skills. Therefore, the gap between students in the urban and rural areas is widening and poverty is driving poor rural kids out of schools, making their future more vulnerable³⁷.

Nonetheless, the transition to online teaching and learning seems inevitable in this day and age, especially in the context of a pandemic like COVID-19. In its pilot project in enhancing digital literacy, Save the Children provided IT training for 42 teachers and more than 400 students of Bao Ha 2 primary school, Lao Cai province. After the training, teachers and students grew more confident in using IT in teaching and learning, knowing how to use interactive education software like Educandy, Kahoot, Menti, and Microsoft Teams³⁸.

SP2 Connectivity and Devices at Home

The requirement to move to online education due to the COVID- 19 pandemic has exposed the digital divide in the region, between the children who have access to digital learning opportunities and those who do not, most of them living in remote areas. Many students lack Internet access, devices, and adequate digital literacy, while teachers are largely unfamiliar with new technology and lacking in training to effectively utilize these new tools.

SP3 Online Access to Curriculum Content

According Online Management Training Company, a recent assessment at 500 preschools in Viet Nam by KidsOnline showed a significant gap in readiness, digital skills, facilities, infrastructure, and learning materials in ethnic minority languages in preschool education.

Young people with disability, living in remote, mountainous areas, and those from ethnic minorities are not perceiving digital education equally as their peers³⁹.

³⁴ UNICEF Viet Nam, 2020

³⁵ Secdev Foundation, 2019

³⁶ Thuy Huong, 2018

³⁷ The Dariu Foundation, 2021

³⁸ H. Nguyen, 2021

³⁹ Tuoi Tre News, 2020

SP4 Community Support

During COVID-19 pandemic, there are several communities, groups and even the government have promoted donating the devices for poor children with their online learning. Several campaigns have been promoted online to name a few: ATM smartphone, Old Laptop - New knowledge, etc.⁴⁰.

On 12 September 2021, the MoET and the Ministry of Information and Community have officially launched the “Connection and Computer for Students” program. Being chaired by the Viet Nam Prime Minister Pham Minh Chinh, the program focused on : internet for all households, computers for all poor students especially who are living in the COVID-19 affected areas, and reasonable internet prices for those students so “no students will be left behind”.

It is reported that while nearly 2 million students lack devices for online learning, the program has immediately received about more than 1 million computers/laptops to support for the targeted cohorts. Sponsors can be named as MobiFone, CMC, Viettel, VNPT - big IT corporations. The program expects to encourage more donors to support devices and money to ensure the continuing online learning for students.

Providers – Companies and Public Private Partnerships

PR1 (partners, sponsors)	Partners and sponsors on Edtech: administrators, sponsors, funders, projects supported and/or funded, project locations, amounts, key focus areas.
PR2 (elearning systems)	Types of elearning management systems and educational apps: users, costs, use cases, limitations (compatibility, accessibility).
PR3 (online content)	Available digital content, sources and language, upload/storage methods, distribution, limitations.
PR4 (integrators, emerging tech)	System integrators, existing technologies that support elearning (email, communication apps, social media), and emerging technologies (AI, AR/VR).

Some examples are given here of intervention and support provided by the key private sector players in EdTech provision in Viet Nam; a full inventory is given in Annex 1).

PR1 Partners/Sponsors

The Government pays attention to Education Technology under the scheme (131/QD-TTg) because it is a key in the digital transformation in education and training in Viet Nam. According to the Government's orientation, the digital transformation in education with a vision to 2025 will bring teaching and learning in the digital environment by 50%; forming several online teaching and learning platforms that are domestic products and used by more than 50% of students; forming a national online repository of learning materials to meet the requirements of learning materials for 50% of the contents for the general education program; more than 50% of higher education institutions offer distance learning (degree) programs.

Project High Touch High Tech Learning Viet Nam⁴¹

The aim of this project was to understand the impact of a High Touch High Tech approach to grade 7 mathematics. It has been seen to be a successful intervention due to its measurable impact on standardised scores in mathematics. The High Touch – High Tech pilot in Viet Nam illustrates the importance of having a whole ecosystem in place to support an intervention, including the availability,

⁴⁰ Vuong, 2021

⁴¹ The Education Commission, 2020

of quality and reliability of functioning technology (i.e. laptops or desktops); compatible hardware and software; teacher training and support, particularly in terms of using and teaching with the particular software. In this case, the initiative had both an 'active learning' and an 'adaptive learning' component. It makes use of an adaptive learning tool called ALEKS (Assessment and Learning in Knowledge Spaces) by McGraw Hill. The idea is that, by assigning some students to work with ALEKS, teachers will have more time to focus on active learning experiences such as project-based activities, discussions, and hands-on experience that nurture higher-order skills such as complex problem-solving and socio-behavioural skills ('high touch'). Teachers were prepared for the pilot by participating in numerous webinars which were recorded so that they could be watched again. A community of practice was set up on a dedicated social media platform for teachers to share resources and experiences. Final year students from teacher training universities were trained to act as teaching assistants for the treatment schools to help reduce the workload of managing large classes with students at different levels. Student math test scores improved by 0.436 SD with lower performing students more likely to receive greater impact from the adaptive learning element of the prototype. There was a decrease in negative attitudes toward math but no increase in positive attitudes.

UNICEF's programs and support

UNICEF has been supporting the Government of Viet Nam to integrate digital literacy and transferable skills in the new curriculum. In Viet Nam, concurrently with the implementation of UNICEF-sponsored pilot program, CFC and OMT also engage teachers, lecturers from the VNU Education University, Viet Nam National College for Education, the Olympia Schools, Ta Quang Buu High School. The project introduces and builds up capability of teachers in using AVR as an innovative tool in preschool (kindergarten) and lower secondary schools to support digital learning in remote areas, with a special focus to ethnic minority girls.

Project Empowering Viet Nameese VET Teachers for Transformation towards Education 4.0 (Project period: Jan 15, 2019 – 30 Jun 2022)

In EMVITET project, this aim is achieved by building a process of development cycles utilizing participatory action research approach (PAR), where teacher and organizational development are intertwined. Vocational and higher education institutions will strengthen the educator networks and work with each other in the new learning ecosystem⁴².

Go Digital ASEAN initiative

The Go Digital ASEAN initiative focuses on closing the digital gap across ASEAN in support of the vision set out by the ASEAN Coordinating Committee on micro, small and medium enterprises (MSMEs). Implemented by The Asia Foundation, with support from Google.org, Google's philanthropic arm. In Viet Nam, Go Digital ASEAN will focus on equipping women-led household businesses and micro-enterprises with critical technology skills to overcome the impacts of COVID-19 pandemic and leverage the digital economy for increased economic opportunities.

Vietnamese-German Program on Reform of TVET in Viet Nam

The Programme consistently approaches the structure of six components of the Digital Transformation (DX) ecosystem in TVET. This is also the proposed Digital Transformation (DX) model by GIZ and consultants to DVET and TVET institutions⁴³.

Digital Citizenship Viet Nam

Digital Citizenship Viet Nam aims to promote online safety and digital skills among Viet Nameese youth. The program supports a range of stakeholders involved in addressing the lack of resources in Viet Nam

⁴² Empowering Vietnamese VET Teachers for Transformation towards Education 4.0, 2021

⁴³ Viet Nameese-German Programme on Reform of TVET in Viet Nam, 2021

dedicated to expanding knowledge of online best practices for fostering a better digital environment in Viet Nam⁴⁴.

PR2 eLearning Systems

E-learning was introduced in Viet Nam in 2007, during the early days of internet rollout. Hoc Mai and eGame were among the few private providers at that time with an education portal from K-12 and online education games.

Currently, e-learning management products in Viet Nam are divided into main segment groups including:

- Products for K12: Including content and platform to support online learning and reviewing.
- Broad Online Learning Platforms: Platform providing popular online courses (Kyna.vn, Unica, Edumall, Brands Viet Nam, Wikilady, Adabook, Testbank, Alada, etc.)
- Tech Learning (Code4Startup, CoderSchool, MClass, Steam for Viet Nam, Teky, MindX): Platform for providing courses on IT.
- Product group for foreign language training: Currently occupying a significant market share in Viet Nam, platforms such as Elsa, Yola, Wallstreet English.

Microsoft

In 2021, Microsoft has organized several EdTech events, including Education Day: Education Reimagine - The Future of Education After COVID-19. This event is co-organized with MoET, ASUS, Lenovo, Wacom, Edmicro, We Master, IIG, AZ Viet Nam, Pyramid S&C, My Bridge Education to present continuous integration and cooperation in teaching, managing and operating support for schools and MoET in digital transformation post COVID-19 pandemic.

Besides, under the global strategy, Microsoft for Education has been strongly promoting for learning platform solution and future skills via Microsoft Educators Center: <https://education.microsoft.com/en-us> including popular training and resources for K-12 and higher education.

Training: MOS (Microsoft Office Specialist) via IIG (<https://iigvietnam.com/vi/>) - Authorized exam centre for several certificates including MOS ,SAT, TOEIC, etc).

IIG is also an authorized centre for IC3 (is considered among younger students, especially Lower Secondary).

Google

Google for Education has gradually approached the market. In Viet Nam, they contracted the pilot Edtech project through Panl to start to work with some selected schools in using some Google's application like Google Classroom and Google Meet.

ClassIn:

ClassIn is an online interactive classroom which is listed in the top 50 Global Edtech by GSV 2020. In Viet Nam ClassIn has been working closely with HCMC DOET to support more than 25,000 teachers during the academic year 2021-2022.

As a dedicated platform for education, ClassIn has explored different educational models including the [“Online-merge-Offline” \(OMO\)](#) one. This hybrid format can empower schools to transform any traditional learning space into a smart classroom, make it more connected, then schools are able to get better learning insights from both in-class, and before and after class activities. ClassIn also believes that OMO teaching will promote more educational opportunities, especially closing the gap in educational inequity for people from distanced locations.

⁴⁴ Secdev Foundation, 2021: Chonghack, Hiepsihiendaicom, ChongHackFB, KhongBatMi.

Galaxy Education

Galaxy Education is a subsidiary of Galaxy Entertainment and Education Group – Leading Entertainment and Education Corporation in Viet Nam. It offers quality digital courses in diverse formats for both PreK and K12 segment under 2 brands HOCMAI and ICAN. Its strategic brand HOCMAI provides No.1 Digital Learning Platform in Viet Nam since 2007 that has reached nearly 6 millions users, helped 20,000+ students to be admitted to gifted schools and 100,000+ students to be admitted to top universities.

The company has made impactful contributions to Viet Nam education with meaningful initiatives such as a series of 52+ workshops on smart learning and teaching methods and skills for students and teachers nationwide; providing “We Think Digital” free courses, in partnership with Facebook, to equip 40,000+ students with knowledge and skills to safely navigate in the digital environment; cooperating with the U.S Embassy in Viet Nam to organise the English speaking contest “Speak to lead” for students of 47 gifted schools across the country; cooperating with different televisions to produce the program “Education without Borders” which broadcasts free lessons (10.000+ broadcasts) to help students, especially students in remote areas with poor internet connection to access to quality education; offering 1,000,000 online test prep courses to students in grade 5-9-12 to help them better prepare for the coming exams during the COVID-19 pandemic; opening its digital learning platform FREE to students from grade 3-11 as soon as the COVID-19 pandemic began; offering students thousands of digital scholarships valued up to 3 billions VND.

As a leading EdTech company in Viet Nam, Galaxy Education is also pioneer in running “Online-merge-Offline (OMO) classes in many schools to provide authentic and innovative learning experiences. This is a new way of learning that caters to the new needs of students and teachers in the post COVID-19 pandemic era.

PR3 Online Content

Viet Nam E-learning Market Segmentation by Content and Technology Services: The E-learning market is dominated by the digital content. The increase in the total number of students enrolling in high schools and the increase in working population in Viet Nam are some of the major reasons for increase in demand of E-learning, while technology services accounted the remaining revenue share in the Viet Nam E-Learning market during the year 2018⁴⁵.

By End User Type (K-12 / School, Universities, Corporates and Others): Business-to-consumer end users contributed highest share in terms of revenue in Viet Nam E-learning market in 2018, since the people of Viet Nam make use of E-learning for their individual purposes more often. Schools were followed by universities, corporate, vocational training programs and other end users such as home users thereby, collectively capturing the remaining revenue share in Viet Nam E-learning market during the year 2018.

There is, however, issue of online-education quality. Historically, Viet Nameese parents have not spent aggressively on online education due to the lack of quality offerings. While some players in the past years have attempted pre-recorded content and live content, they fell short when it came to ensuring that students understood the concept and were able to score well. Pre-recorded classes have significantly poorer engagement metrics versus live classes, as students often lack self-discipline and willingness to churn through hours of videos by themselves⁴⁶.

⁴⁵ Ken Research, 2019

⁴⁶ Thanh Van, 2021

PR4 Integrators and Emerging Tech

Besides EdTech products built to ensure the training process or operation management, tools to support the eLearning training process, build Elearning lectures or integrate into e-learning systems also developed and attracted attention in Viet Nam.

Products of top technology companies such as MS Teams and Google Education are widely used in Viet Nam, allowing the integration of many school lecture resources to support teaching. MS Team also provides email convenient for manipulation and is currently used at the K12 level in Viet Nam. Google offers a full suite of built-in email tools, interactive classrooms, Google meet and Google drivers.

Elearning online training system developed from Moodle core also allows integration of email tools and online teaching tools such as Zoom, Bigbluebutton, MS Teams. School administration systems that support online teaching and integrate with email users' phone numbers are also popular in schools in Viet Nam, such as kidsonline, oneEdu, etc. Construction support tools other lectures such as Adobe presenter, Ispring suite, etc., and other supporting tools such as Test Bank, Azota, etc.

New technologies applying AI and VR/AR in Viet Nam's market today are mainly developed by large technology companies that can integrate or support online training systems, including monitoring systems. Online exams with AI proctors like Examus, lab simulation lectures for K12 with VR/AR technology like ScholAR or 3D lab simulators like PhET, Openclassroom, etc. Besides STEAM/ STEM, developed in Viet Nam in recent years focusing mainly on K12 to develop students' technology knowledge, this market segment is quite open with many leading companies such as Vinarobot, Sunbot, etc.

3. KEY FINDINGS AND RECOMMENDED INTERVENTIONS

Digital transformation in education is one of the top priorities for the government and the MOET. The COVID-19 pandemic has contributed to the rapid improvement of digital education infrastructure, helping Viet Nam move quickly and be relatively ready for the digital transformation in education. However, there is a large gap between education-related regulations and actual processes due to the remarkable development of education technology in Viet Nam in the past five years. Often, these regulations do not keep up well with the development of the industry.

During the period of school closure, 80% of Vietnamese students study online, higher than the world average of 67.5%. And after almost three years of coping with COVID-19, the digital skills of students and teachers up to the present time meet the needs of online teaching & learning in general. However, a large number among around 1.2 million K12 teachers still require further training in computer and online pedagogy skills. The early period of the COVID-19 pandemic revealed many weaknesses in this segment on a national scale since the difference in the access of learners to online education and equipment between central cities and less developed or remote, mountainous areas in Viet Nam are large. Students in areas outside big cities often lack stable Internet access in their families, lack suitable learning equipment, and many had to study using the smartphones of their parents or siblings. Based on the shortage of learning equipment for students in many provinces, some communities, groups and even the government have encouraged the donation of equipment for poor children to learn online. The most typical of which is the program "**Internet and computers for children**" launched by the Ministry of Education and Training in 2021.

Regarding the training program framework and content, currently in Viet Nam, two national education curriculum frameworks are being used in parallel until 2025. Besides, the vocational training sector is receiving growing attention, especially about basic digital skills training.

Possible interventions by ADB

The TIESEA project implementation team in Viet Nam, with the official partnership of four major partners: Google Education, Microsoft education, ClassIn, Galaxy Education, is proposing to develop a hybrid learning project, focusing on supporting the teaching and learning of teachers and students at the secondary school level.

Hybrid learning is an educational model encouraged by MOET because of 1) its sustainability both during and after the COVID-19 pandemic, 2) the ability to flexibly apply educational technology products and services to the training program, to significantly improve the quality of teaching and learning in schools at the most optimal cost for developing countries like Viet Nam. It is proposed that pilot will take place in several secondary schools in some middle-income provinces and focus on several subjects such as English, STEAM/STEM, natural sciences to synchronize and serve the goal of developing human resources and the national economy in the coming time. It is also expected to provide solutions to improve the quality of education for high school students in middle and low-income areas and narrow the gap in education quality with big cities in Viet Nam.

The most significant goal of the program is to provide an effective, technology-applied training model for K12 that is approved by and has consensus within MOET and capable of national scale-up. More optimally, this model can be learned and applied by countries with similar economic, cultural and educational backgrounds.

The program is expected to be successful and has a relatively far-reaching impact on Vietnamese education in this period of reorientation and recovery after the COVID-19 pandemic.

The proposed intervention in Viet Nam will center around the use of smartphones as a language learning and assessment tool. Developing speaking and listening skills in English is a challenge for students in Viet Nam with teachers themselves often lacking confidence in spoken English and national tests being limited to assessing grammar, reading comprehension, and writing skills. The TIESEA team in Viet Nam will work with lecturers from the Faculty of Education Technology, University of Education, to research and design a hybrid learning program suitable to the specific educational conditions found in Viet Nam. The curriculum will prioritize student-centered learning and the use of EdTech to support students to practice their language skills both at school and at home. Materials will be drawn from Hocmai / Elsa/ Pearson e-learning courses as well as more general applications such as flash card apps, Google Read Along, eBooks, songs, poems and English language learning games. As part of school-based assessment, students will be able to record and upload verbal tests and assignments and it is expected that this will motivate them to work on their speaking and listening as well as their reading and writing skills.

The project is expected to launch in the 2022-2023 school year. A minimum of twelve schools (two classes per school) in 2 to 3 cities/ provinces with middle income will be selected to participate in the project. Schools will be selected to represent typical scenarios facing rural schools such as limited Internet connectivity, large class sizes and teachers with a range of experience in teaching English. Schools will be located in rural cities close enough to major population centers to support frequent monitoring and mentoring visits. The target level will be grade 8.

Students and teachers at six of the selected schools (chosen at random from schools in the locality) will be provided with smartphones. Students at the six treatment schools will be able to take the devices home to practice. Teachers at all twelve schools will participate in similar training programs. All students will participate in pre- and post-tests based on the Common European Framework of Reference for languages (CEFR). Tests will include speaking and listening components consistent with the CEFR standard. Monitors will observe classes through the academic year as part of an ongoing process evaluation. Their visits will also provide an opportunity to mentor teachers and solve any problems they may be facing.

It is important that the pilot provide an effective, technology-applied training model for K-12 that is approved by MOET and capable of national scale-up. To achieve this goal, the implementation team in Viet Nam plans to connect the project with relevant ministries and agencies to get official support and companionship from Viet Nam's Ministry of Education and Training (MoET).

The program is expected to be successful and has a relatively far-reaching impact on Vietnamese education during and after the COVID-19 pandemic.

REFERENCES

- Acclime. (2021). EdTech in Viet Nam – a sector regulatory analysis. Retrieved from <https://vietnam.acclime.com/news-insights/edtech-in-vietnam-a-sector-regulatory-analysis/>
- Austrade. (2020). Viet Nam *EdTech Scoping Study*. Retrieved from <https://www.austrade.gov.au/australian/education/news/data/austrade-report-vietnam-edtech-scoping-study>
- Binh Minh. (2021). *Parents are overwhelmed with messages from their child's chat group*. VNEexpress. Retrieved from: <https://vnexpress.net/phu-huynh-qua-tai-tin-nhan-tu-nhom-chat-cua-con-4409656.html>
- Bozhok, G. (Producer). (2021, 18 November 2021). Viet Nam's Emerging Educational Tech Sector. Retrieved from <https://gbozhok.medium.com/vietnams-emerging-educational-tech-sector-5c0ce5861313>
- Certiport. (2017). IC3 Digital Literacy Certification. In I. D. L. Certification (Ed.): Certiport.
- Cong Tam (2021). *Strengthening the ICT application in education and training*. Retrieved from: <https://danang.gov.vn/chinh-quyen/chi-tiet?id=5816&c=3>
- Dang, K. (2020). Viet Nam digital development among the fastest in the world. Retrieved from <https://e.vnexpress.net/news/news/vietnam-digital-development-among-the-fastest-in-the-world-4211718.html>
- Dharmaraj, S. (2021). Viet Nam Launches 'Internet Connection and Computers for Students' Programme. Retrieved from <https://opengovasia.com/vietnam-launches-internet-connection-and-computers-for-students-programme/>
- Dione, O. (Producer). (2020, 10 November 2021). Digital Economy in Viet Nam: Building the Foundations for Future Growth. Retrieved from <https://blogs.worldbank.org/eastasiapacific/digital-economy-vietnam-building-foundations-future-growth>
- EdTech in SouthEast Asia. (2020). *EdTech in SouthEast Asia: Opportunities for EdTech development and investment in five Southeast Asian markets: Indonesia, Malaysia, the Philippines, Thailand and Viet Nam*. Retrieved from <https://octavafoundation.org/wp-content/uploads/2021/07/Edtech-in-Southeast-Asia-White-Paper-Executive-Summary.pdf>
- Empowering Viet Nameese VET Teachers for Transformation towards Education 4.0. (2021). Empowering Viet Nameese VET Teachers for Transformation towards Education 4.0. In.
- Extended Reality in Education (2021). Extended Reality in Education: An UNICEF-funded project. Retrieved from https://xr-elearn.com.vn/?page_id=174
- Fatalvero, N. (2020). A peek inside Viet Nam's edtech industry. *Newsletter*. Retrieved from <https://www.techinasia.com/peek-vietnams-edtech-industry>
- Giang, L. (2021). National digital transformation program to 2025, orientation to 2030. Retrieved from <http://asemconnectvietnam.gov.vn/default.aspx?ID1=2&ZID1=14&ID8=99391>.
- Hoang, H.P., Le, A.V., and Reimers, F. (2020). *Viet Nam: Hoc tren truyen hinh (Distance learning through TV Broadcasting)*, Education Continuity series, OECD Publishing , Paris Retrieved from: <https://oecdeditoday.com/wp-content/uploads/2020/09/Viet-Nam-Distance-Learning-Through-TV-Broadcasting.pdf>
- Iwamoto, K. (2019). Viet Nam EdTech startup aim. *Startups*. Retrieved from <https://asia.nikkei.com/Business/Startups/Viet-Nam-ed-tech-startup-aims-to-fill-Southeast-Asia-s-talent-pool>
- Kemp, S. (2021). *Digital in Viet Nam 2021*. Retrieved from <https://datareportal.com/reports/digital-2021-vietnam>

- Ken Research. (2019). Viet Nam E-Learning Market Outlook to 2023 – Driven by Rising Adoption of Smartclasses, E-books in Schools and MOOCs and Smart Authoring Tools in Corporate Training and Test Preparation Segment. Retrieved from <https://www.kenresearch.com/education-and-recruitment/education/vietnam-e-learning-market-outlook/248568-99.html>
- Le, Q. B., & Tran, T. P. (2020). *Digital Economy and Digital Transformation in Viet Nam*. Retrieved from European Union: <https://www.economica.vn/Content/files/PUBL%20%26%20REP/EVFTA%20and%20Digital%20Economy%20in%20Viet%20Nam%20ENG.pdf>
- Liew, R. (2021). Are Viet Nam's edtech startups ripe for take-off? *Newsletter*. Retrieved from <https://www.techinasia.com/vietnams-edtech-startups-ripe-takeoff>
- Minh, P. (2021). Free training for teachers in applying ICT for teaching. *Giaoduc Viet Nam*. Retrieved from: <https://giaoduc.net.vn/giao-duc-24h/boi-duong-mien-phi-cho-giao-vien-su-dung-cong-nghe-thong-tin-trong-day-hoc-post220796.gd>
- Morisset, J. (Producer). (2021). Digital transformation in Viet Nam: Skills must transform too. Retrieved from <https://blogs.worldbank.org/eastasiapacific/digital-transformation-vietnam-skills-must-transform-too>
- Ngoc, T. (2004). *Enhancing the EMIS application into education management and development*. Tuoitre.vn. Retrieved from: <https://tuoitre.vn/nang-cao-ung-dung-cua-emis-vao-quan-ly-va-phat-trien-giao-duc-52972.htm>
- Nguyen, H. (2021). Enhancing digital literacy for students. Retrieved from: <https://vietnamtimes.org.vn/enhancing-digital-literacy-for-students-31026.html>
- Nguyen, Q. (2020). Viet Nam 15th best performer in Asia for digital well-being: report. Retrieved from: <https://e.vnexpress.net/news/news/vietnam-15th-best-performer-in-asia-for-digital-well-being-report-4152714.html>
- Nguyen, Q. (2021). Viet Nam makes second biggest jump in digital inclusion rankings. Retrieved from: <https://e.vnexpress.net/news/news/vietnam-makes-second-biggest-jump-in-digital-inclusion-rankings-4241909.html>
- Phan, A. (2020). Viet Nam shows significant progress among Asia-Pacific digital societies: report. Retrieved from <https://e.vnexpress.net/news/news/vietnam-shows-significant-progress-among-asia-pacific-digital-societies-report-4186505.html>
- Portulans Institute. (2020). *Network Readiness Index 2020 Viet Nam*. Retrieved from: <https://networkreadinessindex.org/wp-content/uploads/2020/12/Viet%20Nam.pdf>
- Phuong, L. (2021). *Building national database on education and training*. Baochinhpheu.vn. Retrieved from: <http://baochinhpheu.vn/Giao-duc/Xay-dung-co-so-du-lieu-ve-giao-duc-va-dao-tao/447468.vgp>
- PwC Viet Nam. (2021). *Viet Nam Digital Readiness Report*. Retrieved from: [https://www.pwc.com/vn/en/publications/vietnam-publications/digital-readiness.html#:~:text=PwC%20Viet%20Nam's%20survey%20on%20technology%2C%20jobs%20and%20skills&text=believe%20that%20technology%20will%20change,\(3%2D5%20years\).&text=would%20learn%20new%20skills%20now,order%20to%20improve%20future%20employability.](https://www.pwc.com/vn/en/publications/vietnam-publications/digital-readiness.html#:~:text=PwC%20Viet%20Nam's%20survey%20on%20technology%2C%20jobs%20and%20skills&text=believe%20that%20technology%20will%20change,(3%2D5%20years).&text=would%20learn%20new%20skills%20now,order%20to%20improve%20future%20employability.)
- Samuel, P. (2021). Viet Nam's Digital Transformation Plan Through 2025. Retrieved from: <https://www.vietnam-briefing.com/news/vietnams-digital-transformation-plan-through-2025.html/>
- Secdev Foundation. (2018). SecDev Foundation partners support Viet Nam network for child online safety. Retrieved from: <https://secdev-foundation.org/secdev-foundation-partners-support-vietnam-network-for-child-online-safety/>

- Secdev Foundation. (2019). UNESCO report highlights need to strengthen digital citizenship education in Viet Nam. *Digital Citizenship Viet Nam*. Retrieved from: <https://secdev-foundation.org/unesco-report-highlights-need-to-strengthen-digital-citizenship-education-in-vietnam/>
- Secdev Foundation. (2021). Digital Citizenship Viet Nam. Retrieved from: <https://secdev-foundation.org/what-we-do/digital-safety-opportunity-and-citizenship/vietnam-project/>
- Thanh Thuy. (2021). It's time for a mass digital literacy campaign. *Viet Nam News Society*. Retrieved from: <https://vietnamnews.vn/society/1019513/its-time-for-a-mass-digital-literacy-campaign.html>
- Thanh Van. (2021). Promise more than evident in Viet Nam's edtech fortunes. Retrieved from: <https://vir.com.vn/promise-more-than-evident-in-vietnams-edtech-fortunes-87826.html>
- The Dariu Foundation. (2021). Digital Literacy Skills. Retrieved from https://darius.org/?page_id=913
- The Education Commission. (2020). *Education Workforce Initiative: Country Report - High Touch High Tech Learning Viet Nam*. Retrieved from: <https://educationcommission.org/wp-content/uploads/2020/07/2020-EC-Country-Report-Viet-Nam-ENG.pdf>
- The Inclusive Internet Index Simulator. (2020). The Inclusive Internet Index Simulator - Viet Nam. Retrieved from: <https://theinclusiveinternet.eiu.com/simulator/countries/VN>
- Thuy Huong. (2018). More than 70% of Viet Nameese children facing one or more cyber risks Retrieved from: <https://tuoitrethudo.com.vn/hon-70-tre-em-viet-nam-dang-doi-mat-voi-rui-ro-khong-gian-mang-62386.html>
- Tuoi Tre News. (2020). Viet Nam confronted by digital gap: UNICEF talk. Retrieved from: <https://tuoitrenews.vn/news/society/20201009/vietnam-confronted-by-digital-gap-unicef-talk/57189.html>
- UNICEF Viet Nam. (2020). REIMAGINE TALK: Digital Transformation in Viet Nam [Press release]. Retrieved from: <https://www.unicef.org/vietnam/press-releases/reimagine-talk-digital-transformation-viet-nam>
- Viet Nam, G. T. (2021). What the future could hold for Education investment in Viet Nam. In G. T. Viet Nam (Ed.). Ha Noi, Viet Nam: Grantthornton.
- Viet Nameese-German Programme on Reform of TVET in Viet Nam. (2021). Digital Transformation. Retrieved from: <https://www.tvet-vietnam.org/digital-transformation>
- Viet Nam Government. Decision 117/QĐ-TTg: (25 Jan 2017) Approval on the proposal of strengthening ICT application in managing and supporting for teaching, learning and researching for better education quality in the period of 2016-2020, heading to 2025. Retrieved from: http://vanban.chinhphu.vn/portal/page/portal/chinhphu/hethongvanban?class_id=2&_page=1&mode=detail&document_id=188112
- Viet Nam Government. Decision 1559/QĐ-TTg: (10 Sept 2015) Development of Distance Learning Phase 2015-2020. Retrieved from: http://vanban.chinhphu.vn/portal/page/portal/chinhphu/hethongvanban?class_id=2&_page=1&mode=detail&document_id=181344
- Viet Nam Government. Resolution No. 29-NQ/TW (November 4, 2013) of the 8th Government Conference in the 11th term on fundamental and comprehensive reform of education and training to meet the requirements of industrialization, modernization in the socialistic market economy conditions and international integration. Retrieved from: <https://moet.gov.vn/tintuc/Pages/doi-moi-can-ban-toan-dien-gd-va-dt.aspx?ItemID=3928>
- Viet Nam Ministry of Education and Training. Building Higher Education Management Information System. (24 June 2020). Retrieved from: <https://moet.gov.vn/tintuc/Pages/doi-moi-can-ban-toan-dien-gd-va-dt.aspx?ItemID=6741>

- Viet Nam Ministry of Education and Training. Circular No 09/2021/TT-BGDĐT (30 March 2021) Regulation in management and organize online classes for K-12 and continuing education centers. Retrieved from: <https://moet.gov.vn/van-ban/vanban/Pages/chi-tiet-van-ban.aspx?ItemID=1396>
- Viet Nam Ministry of Education and Training. Circular No. 21/2017/TT-BGDĐT (September 6, 2017) on Regulations on IT application in online training and retraining activities. Retrieved from: <https://moet.gov.vn/van-ban/vanban/Pages/chi-tiet-van-ban.aspx?ItemID=1263>
- Viet Nam Ministry of Education and Training. Connection and computers for students: sharing is caring. 12 September 2021. Retrieved from: <https://moet.gov.vn/tintuc/Pages/tin-tong-hop.aspx?ItemID=7514>. Further English review on this program can be found here: <https://tuoitrenews.vn/news/education/20210914/vietnam-to-give-1-million-computers-for-k12-students-online-studies-this-year/63095.html>
- Viet Nam Ministry of Education and Training, Decision 4919_QD_BGDĐT (31 Dec 2020) Approval on the proposal of ICT application and development to Digital Government and ensure for the information security of MoET in the period from 2021-2025. Retrieved from: <https://moet.gov.vn/giaoducquocdan/tang-cuong-ung-dung-cntt/Pages/chi-tiet-van-ban-chi-dao-dieu-hanh.aspx?ItemID=2890>
- Viet Nam Ministry of Education and Training. Digital transformation in Viet Nam Education: Status and solution. (4 November 2021). Retrieved from: <https://moet.gov.vn/giaoducquocdan/tang-cuong-ung-dung-cntt/Pages/tin-tuc.aspx?ItemID=7591>
- Viet Nam Ministry of Education and Training. Document 1166/BGDĐT-CNTT on implementing the Decision 117/QĐ-TTg on 25/01/2017 by the Government. Retrieved from: <https://e-ict.gov.vn/laws/detail/Cong-van-so-1166-BGDĐT-CNTT-ve-viec-trien-khai-Quy-et-dinh-so-117-QĐ-TTg-ngay-25-01-2017-cua-Thu-tuong-Chinh-phu-719/>
- Viet Nam Ministry of Education and Training. Document 4983/BGDĐT-CNTT (28 September 2015) on Guidelines on ICT application objectives for the school year of 2015-2016. Retrieved from: <https://e-ict.gov.vn/laws/detail/Huong-dan-thuc-hien-nhiem-vu-CNTT-nam-hoc-2015-2016-8/>
- Viet Nam Ministry of Education and Training. Document 4003/BGDĐT-CNTT (7 Oct 2020) for the guidelines of applying ICT for the school year 2020-2021. Retrieved from: <https://e-ict.gov.vn/laws/detail/Huong-dan-nhiem-vu-Cong-nghe-thong-tin-nam-hoc-2020-2021-742/>
- Viet Nam Ministry of Education and Training, Document No. 4096 BGDĐT-CNTT (20 Sept 2021) Guidelines on ICT application and education management in the school year 2021-2022. Retrieved from: <https://moet.gov.vn/giaoducquocdan/tang-cuong-ung-dung-cntt/Pages/chi-tiet-van-ban-chi-dao-dieu-hanh.aspx?ItemID=3016>
- Viet Nam Ministry of Education and Training. Enhancing Teacher Education Program. A holistic picture on K-12 teachers' training demand. (7 January 2022) Retrieved from: <https://etep.moet.gov.vn/tintuc/chitiet?Id=1836>
- Viet Nam Ministry of Education and Training. IT Department. Document No. 4116/BGDĐT - CNTT on guidelines to implement the ICT application in the school year of 2017-2018. Retrieved from: <https://e-ict.gov.vn/laws/detail/Cong-van-so-4116-BGDĐT-CNTT-ve-viec-huong-dan-thuc-hien-nhiem-vu-CNTT-nam-hoc-2017-2018-721/>
- Viet Nam Ministry of Education and Training. Training on ICT application on school management and administration. (3 December 2021). Retrieved from: <https://moet.gov.vn/tintuc/Pages/tin-tong-hop.aspx?ItemID=7653>
- Viet Nam Ministry of Industry and Trade, & UNDP. (2019). Industry 4.0 Readiness of Industry Enterprises in Viet Nam. Retrieved from Ha Noi, Viet Nam: <https://www.vn.undp.org/content/vietnam/en/home/library/I40.html>

- Viet Namnet. (2020). Digital literacy training available to 65,000 microfinance clients in Viet Nam. Retrieved from: <https://vietnamnet.vn/en/society/digital-literacy-training-available-to-65-000-microfinance-clients-in-vietnam-693383.html>
- Vinh, Le and others (2019). The DKAP Project, The Country Report of Viet Nam. Retrieved from: <https://dkap.org/wp-content/uploads/2019/09/UNESCO-DKAP-Viet-Nam-Country-Report.pdf>
- VTV (Viet Nam Television), (9 January 2016) Viet Nam Television's Education TV channel officially launched. Retrieved from: <https://english.vtv.vn/news/vietnam-television-s-education-tv-channel-officially-launched-20160110104108243.htm>
- Vuong, Tien (2021). *Giaoducvathoidai*. Proactively mobilise the resources and device like smartphone, laptop to support online learning. Retrieved from: <https://giaoducthoidai.vn/ket-noi/chu-dong-huy-dong-ho-tro-dien-thoai-laptop-giup-hoc-sinh-hoc-truc-tuyen-6LRyC2S7R.html>
- World Bank. (2021). *Digital Viet Nam: The Path to Tomorrow*. Retrieved from: <https://openknowledge.worldbank.org/handle/10986/36190>
- World Bank Group. (2019). *Digital Government and Open Data Readiness Assessment*. Retrieved from Washington DC 20433: <https://openknowledge.worldbank.org/handle/10986/32547>

ANNEXES

Annex 1: Inventory of EdTech providers

PR 1 Partners / sponsors

Because Viet Nam's EdTech market is still in its early stages, it will be ready to accept trends in the region and the world, including blended learning models, personalized learning and AI applications in training & teaching, gamification for content and learning activities.

At the same time, due to the impact of the COVID-19 pandemic and the government's digital transformation strategy in education, LMS & CMS are in high demand for all sectors in recent times and is expected to continue to grow to various degrees even after the COVID-19 pandemic. Hybrid/blended learning is projected to flourish as a long-term solution for schools during and after the COVID-19 pandemic. Some of the major investors in EdTech are listed below; the ownership and sponsorship models vary from venture capital to collaborative partnership. The number and scale of the market interest is significant.

These major commercial players are itemised here for consideration alongside the development partners' initiatives outlined in Section PR1 in the main body of the report above. The major not-for-profit players include, for example, intergovernmental organisations and NGOs: ASEAN, UNESCO, GIZ, and The Education Commission from South Korea and voluntary organisations such as the Secdev Foundation

EdTech startups in Viet Nam also attract numerous domestic and foreign venture capital funds thanks to their high growth potential. Several startups have raised quite a large amount of capital, such as Topica Edtech (\$50 million), English learning app ELSA with \$5 million co-sponsored by Viet Nam Investments Group and SIG, CoderSchool raised 2.6 million dollars of Monk's Hill Ventures. MindX raised a \$3 million Series A round from Southeast Asian company Wavemaker Partners, Vietnamese investment bank Thien Viet Securities and a US-based investor. Clevai raised \$650,000 USD in 2020 from BOD Tech Ventures. In 2021, Clevai raised an additional US\$2.1 million from Singapore-based Altara Ventures.

Investment funds	Website
BestB Capital	https://www.bestbcapital.com/vi
Quỹ Dragon Capital	https://www.dragoncapital.com/
Quỹ Vina Capital	https://wm.vinacapital.com/
Forge Ventures	https://forge.vc/
Venturra Discovery	https://www.venturra.com/
iSeed Sea	https://iseed.asia/
Wavemaker Partners	https://wavemaker.vc/

Beacon Fund	https://beaconfund.com/
Apax Holdings	http://apaxholdings.com.vn/
Insignia Ventures Partners	https://www.insignia.vc/
Kakao Ventures	https://www.kakao.vc/
Altos	https://altos.vc/
ESP Capital	https://www.espcapital.net/
KKR Global Impact	https://www.kkr.com/businesses/global-impact
A. Monk's Hill Ventures	https://www.monkshill.com/
XA Network	https://xanetwork.co/
Iterative	https://www.iterative.vc/
Redefine Capital Fund	https://redefinecapitalpartners.com/
Chiba Dojo	https://chiba-dojo.jp/
Genesia Ventures	https://www.genesiaventures.com/en/top-en/
Viet Nam Investments Group	https://www.vigroup.com/en/index.htm
SIG	https://sig-asiavc.com/
Gradient Ventures	https://www.gradient.com/
Touchstone Partners	https://touchstone.vc/
Vulcan Capital	https://capital.vulcan.com/
Pavilion Capital	http://www.pavilioncapital.com/
Quỹ MB Capital	https://www.mbcapital.com.vn/vi/
Viet Capital Asset Management	https://vietcapital.com.vn/en/
mekong capital	https://www.mekongcapital.com/vi
Quỹ IDG Ventures Viet Nam	https://idgvv.com.vn/en/
Quỹ Viet Nam Oman Investment	https://www.voi.vn/
Viet Nam Equity Holding	https://saigonam.com/fund-management/veh

Fund VI (Viet Nam Investments) Group	http://www.vigroup.com/en/index.htm
CyberAgent Capital	https://www.cyberagentcapital.com/en/
công ty cổ phần capella việt nam	http://capella.com.vn/
Softbank	https://www.softbank.jp/en/
Startup Viet Nam Foundation	https://svf.org.vn/
Công ty cổ phần đầu tư khởi nghiệp quốc gia	https://dautukhoinghiep.com/
BK Holdings	http://www.bkholdings.com.vn/vn/
Angles4us	http://www.angels4.us/
Alpha Vision	https://www.alpha-vision.com/
Intel capital	https://www.intel.com/content/www/us/en/intel-capital/overview.html
Kusto Group	https://www.kustogroup.com/
Patamar Capital	http://patamar.com/
FPT Ventures	http://fptventures.com/
Index Ventures	https://www.indexventures.com/
SEAF	https://www.seaf.com/
Patamar Capital	https://patamar.com/
Kusto Viet Nam	https://kusto.com.vn/
Golden Gate Venture	https://www.goldengate.vc/

PR2 Elearning systems

Below is a list of typical learning management systems and educational support software internationally, categorized by primary function. These systems/software are used in the administration and support of e-learning. As long as there is an Internet connection, user activities on these platforms will be updated and tracked, so they are highly convenient and maximize the ability to be proactively used.

EdTech solution	Website
1. Learning Management System (LMS)	
K12 online	https://k12online.vn/
VNPT E-Learning	https://lms.vnedu.vn/
Blackboard	https://www.blackboard.com/
Canva	https://www.canva.com/
Century	https://www.century.tech/
Classin	https://www.classin.com/en/
Edmodo	https://new.edmodo.com/
Edunation	https://www.edunation.co/
Ekstep	https://ekstep.org/
Galaxy Education	https://hocmai.vn/
Google Classroom	https://classroom.google.com/
Moodle	https://moodle.org/
Rumie	https://learn.rumie.org/jR
Schoology	https://www.schoology.com/
SeeSaw	https://web.seesaw.me/
Skooler	https://skooler.com/
2. Online interaction apps	
Zoom	https://zoom.us/
Microsoft Teams	https://www.microsoft.com/education/products/teams
Dingtalk	https://www.dingtalk.com/vi-vn
FlipGrid	https://info.flipgrid.com/
Google Hangouts	https://hangouts.google.com/
Mentimeter	https://www.mentimeter.com/
Meet – Google	https://meet.google.com/
Zavi	https://zavi.me/

3. Presentation apps	
Buncee	https://app.edu.buncee.com/
EdPuzzle	https://edpuzzle.com/
Explain Everything	https://explaineverything.com/
Explee	https://explee.com/
Nearpod	https://nearpod.com/
Peardeck	https://www.peardeck.com/
Powtoon	https://www.powtoon.com/
Prezi	https://prezi.com/
Squigl	https://squigit.com/
Storyboardthat	https://www.storyboardthat.com/
Thinglink	https://www.thinglink.com/
4. Notes and Whiteboard apps	
Apowersoft Recoder	https://www.apowersoft.com/free-online-screen-recorder
Loom	https://www.loom.com/
Screeencast-o-matic	https://screencast-o-matic.com/
Screeencastify	https://www.screencastify.com/
Whiteboards	https://whiteboard.fi/
Google Jamboard	https://jamboard.google.com/
Limnu	https://limnu.com/
Microsoft Whiteboard	https://www.microsoft.com/microsoft-365/microsoft-whiteboard/
Miro	https://miro.com/
Scribblar	https://scribblar.com/
Sketchboard	https://sketchboard.io/
Web White Board	https://webwhiteboard.com/
Whiteboard Fox	https://r8.whiteboardfox.com/
Ziteboard	https://ziteboard.com/

5. Interactions, Planning, Practice and Assessment apps	
Classpoint	https://www.classpoint.io/
Enuma	https://enuma.com/
IXL Learning	https://www.ixl.com/
Kahoot	https://kahoot.it/
Khan Academy	https://www.khanacademy.org/
Mindspark	https://mindspark.in/
OneCourse	https://onebillion.org/onecourse/app/
Padlet	https://padlet.com/
Planer in MS team	https://tasks.office.com/
Trello	https://trello.com/vi
Siyavula	https://www.siyavula.com/
Socrative	https://www.socrative.com/

PR3 Online content

Online content is typically in the form of digital learning resources, both commercial and OER; Available digital content, sources and language, upload/storage methods, and distribution.

Product	Website
SMAS	https://smas.edu.vn/Home/LogOn?ReturnUrl=%2f
Bachkim	bachkim.vn
Hoola	https://hoola.vn
Edu box	http://edubox.vn
Sunbot	http://sunbot.vn
Hương Việt Elearning	https://avinasolutions.com
Yotalk	https://yotalk.edu.vn/

PR4 Integrators / emerging trends

Some of the current supporting products for Edtech include exam bank tools, online grading software, online supervisors, lecture preparation software, simulation lecture notes, practice experiments, etc.

Product	Website
Examus online proctoring	https://examus.com/
Bachkim	bachkim.vn
Hoola	https://hoola.vn
Open Classroom	https://openclassroom.edu.vn/
SMAS	https://smas.edu.vn/Home/LogOn?ReturnUrl=%2f
Teky	https://teky.edu.vn/
Sunbot – support for STEAM learning	http://sunbot.vn/
VINA Robot	https://vinarobots.com/

Annex 2: Survey findings – Viet Nam

As part of the process in attempting to create an understanding of the current status of eReadiness in each of the four project countries the team has been provided teachers' survey data conducted by the Asian Development Bank (ADB) Sustainable Development and Climate change division in cooperation with TIESEA. The surveys attempt to better understand roughly three areas of teacher interaction with EdTech covering digital access (availability of devices), digital skill (ability to use devices) and digital literacy (ability to manipulate devices to create materials and train others).

Over the course of the month of January 2022 an online survey using Kobotoolbox⁴⁷ was conducted with teachers in Indonesia and Viet Nam reaching ~5600 and ~2100 teachers across the three levels of grades 1-12, TVET and higher education. Noting that the purpose of the survey was to reach teachers who are active in the use of online and digital learning.

The research team used a variety of methods to reach the target users, but primarily their approach was via social media teachers' groups and online professional communities of practice. Teachers were provided with an online link to the survey tool and they completed the survey in their own time with complete individual anonymity. The survey tool is able, however, to identify the geolocation of the participants, allowing a national map of respondents' location. In this way it has been possible to ensure that the survey covers all areas of each country, including both urban and rural locations.

In order to assure quality of data the survey aimed to collect a minimum sample of 1000 responses covering teachers from grades 1-12, TVET and higher education levels. In all cases the target response number was significantly exceeded for both Indonesia and Viet Nam. Additional criteria on demographic distribution were collected by assuring proportionate spread across regions of the country and urban/rural location. We were also able to collect demographic indicators on sex, years of teaching experience. Those variables then serve as cross comparison in analyzing the core questions on digital access, skill and literacy as is presented through the following graphs.

Limitation on survey sample

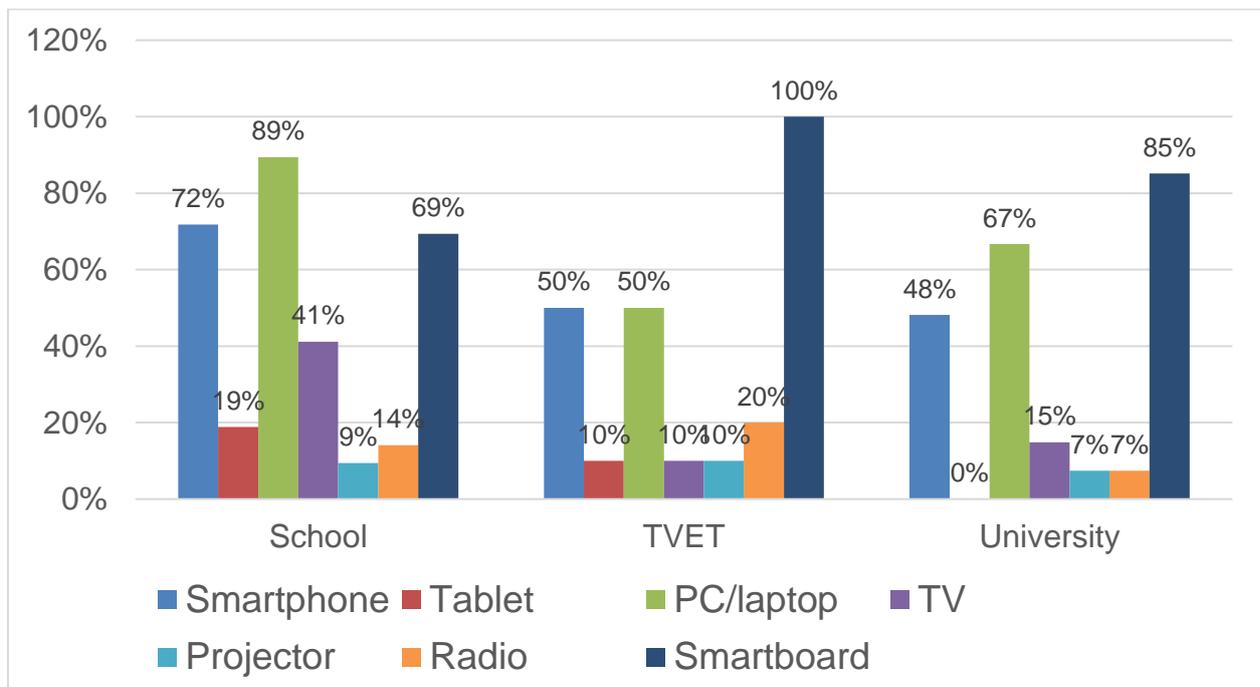
It is recognized that these surveys, being conducted solely online are biased toward respondents with access to the internet (and potentially may have omitted those who are not connected or poorly connected to the internet), thus creating the 'skew' of responses from teacher/educators with internet access vs those without it. E.g., as devices and connectivity are typically related to each other, the survey results regarding access to devices, teacher digital skills/literacy, etc. may have been overstated (as only those teachers with devices and internet access may have completed the survey).

⁴⁷ <https://www.kobotoolbox.org/>

Access to devices by teachers at schools, TVET and universities

The graph shows teacher access (availability) across a range of seven common digital devices that are deployed across schools the world over. The purpose of the question is for teachers to self-report on which devices they have access to at school. In the survey question the respondents were allowed to choose as many devices as they have regular access to at school thus the data can be used to look at individual device availability and at the same time the range of devices available to teachers per country polled.

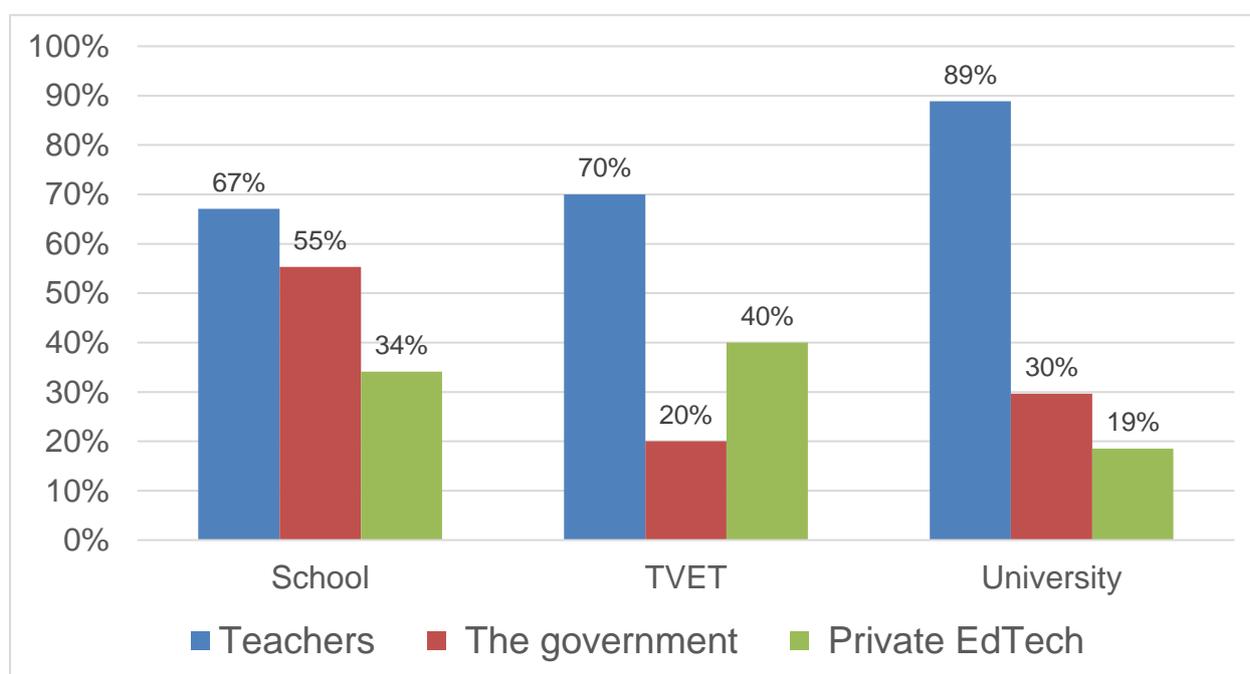
TIESEA polled ~2100 teachers from school, TVET and university levels to ask about the type of devices they most often access at school. Of the seven types of devices that teachers around the world commonly access while at their institution three of them appear to be more prevalent at a rate of over 50%; smartphone, PC/laptop and smartboard while tablet, TV, Radio and projectors are accessed by less than 30% of those polled. It is notable that in Viet Nam the projector is accessed at 7% or less, this seems to correspond with high access of smartboards which makes sense as the smartboard can take up many of the functions of a digital projector.



Who provides or creates the content?

This question was designed to assess three key sources of digital content that teachers often draw from to use at school. Three choices were given teachers (self-sourced – created, borrowed, adapted), government (provided through the education system) and/or via private EdTech (other providers).

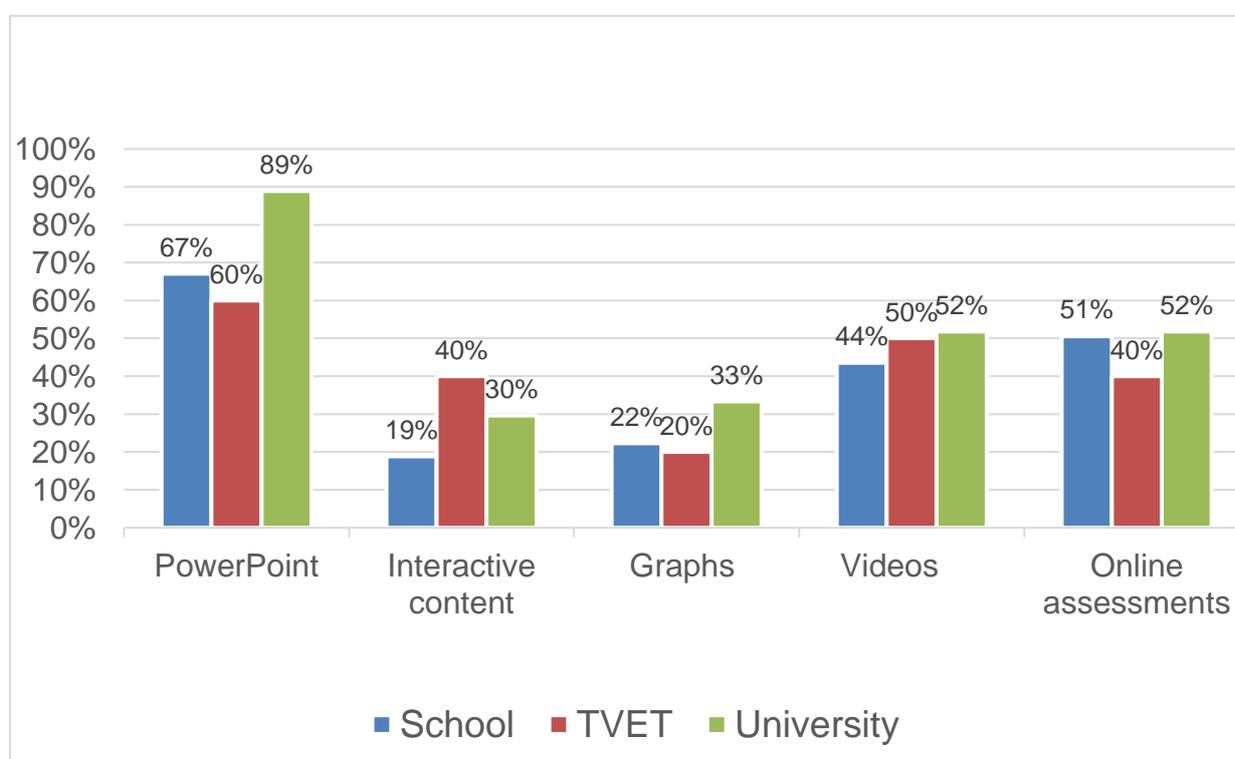
TIESEA wanted to know where Vietnamese teachers get the digital content (self-provided, from the government or via private EdTech providers) used in their classes. Most notable in the results of the survey of over 2100 teachers across the three levels of school, TVET and University was that 89% of those from the university level provide their own content, in fact across all three levels teachers report positively that they are providing their own content (sources, adapt, create). The profile of TVET and university level are quite similar across the three content sources while the school level shows they are relying less on self-provided sources. These results show a great opportunity in that teachers across all levels should be self-providing a larger amount of digital content. Access to devices, skill to use such devices and ability to make content are clearly in demand.



Digital content that teachers can create

This question is an attempt to get teacher feedback across 5 common types of content that typically made to improve teaching/learning and self-made. The ability of teachers to make their own content is imperative not only in traditional formats yet equally so in digital formats.

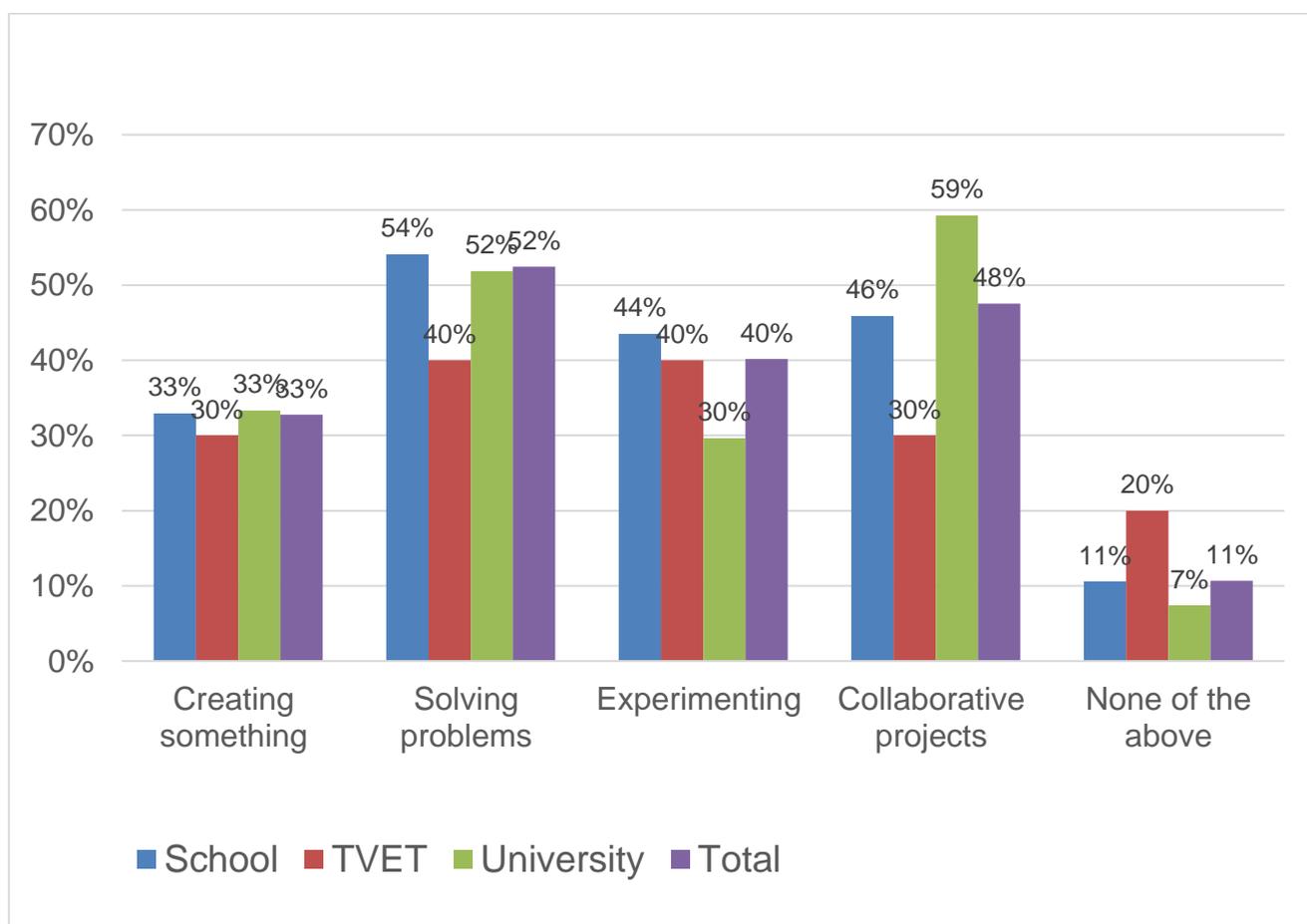
TIESEA asked teachers in Viet Nam about their ability to create five types of content (PowerPoint, interactive content, graphs/charts, video, and online assessment). A clear pattern comes forth in the data set that those at the school level create less content than TVET and TVET level teachers create less content than university levels. In line with expectations it is with PowerPoint that across all three levels teachers are more adept while they are less capable at creating interactive content and graphs. This is a common finding as PowerPoint is perceived as a more accessible and easy tool to use while creating interactive content and graphs (requires data sets) is relatively complex. This also tells us where teachers need help if it is perceived that interactive content is more beneficial to learning outcomes.



Teachers engage students in the following creative activities

Twenty-first century skills are commonly understood to be the core need in workforce development throughout the world. The question looks at how teachers integrate 21st century skills using digital tools in their instruction.

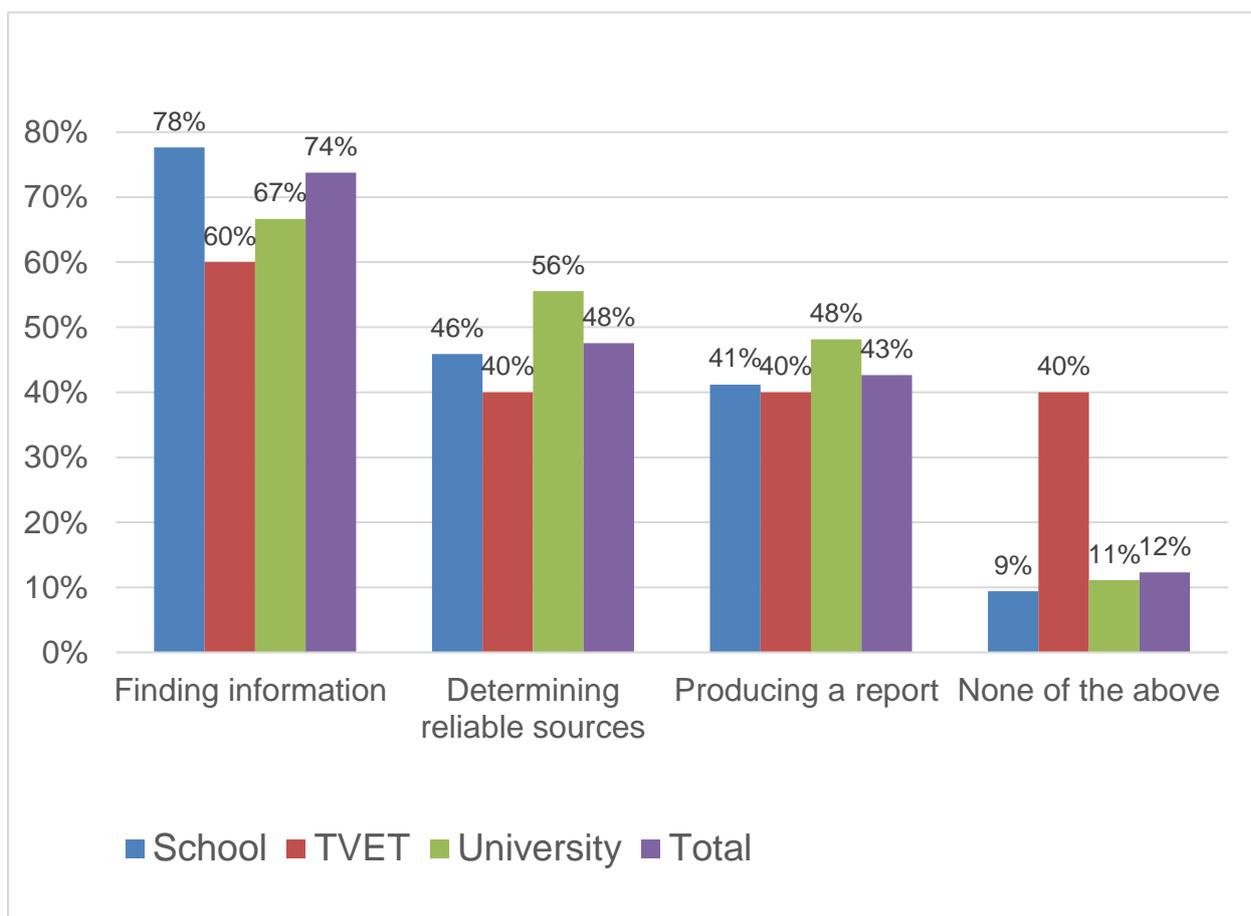
In this question TIESEA wanted to check on how digital technologies are being used to further 21st century skills (i.e., experimenting, collaborating, creating, problem solving). The important point learned from this question in Viet Nam is that teachers perceive they are using digital technology to help students improve on 21st century skills. The results across the 4 areas are quite fairly strong yet do leave room for improvement as the curriculum is modernized and the necessity of using digital technology to infuse 21st century skills is emphasized. While we have no clear way of discerning the quality of such learning it is evident that they are engaging and considering the use of tools across the board.



Teachers teach students to conduct online research in the following ways:

Where teachers engage students on research (online), this question attempts to query teachers on the key areas in which they focus in building student digital skills. The question is focused on three key stages in inquiry-based learning – finding information (interaction/clarification), determining reliable sources (clarification/questioning) and producing a report (design).

TIESEA polled over ~2100 teachers on training their students to conduct research. It is important to note that central to curriculum throughout the world is building student ability to learn new things and explore through inquiry-based learning. In modern day use of online resources to conduct school-based research it is assumed there are three key areas in which teachers should engage their students to build research skills (finding information, determining the reliability of such information and producing reports based on the information found). Teachers across all the three levels, seem to equally teach their students on ‘Finding information related to a task or assignment on the internet’. However, there is a significant disparity between higher education and schools and TVET in terms of ‘Determining whether an online source is reliable’ and ‘Producing a report by synthesizing (combining) information from various online sources.’ Overall, across the three levels, the ‘Producing a report by synthesizing (combining) information from various online sources’ seems the weakest area.



Annex 3: Report on gender gap in EdTech in Viet Nam

Gender inequality in education

Gender disparities are pronounced within the educational sector workforce, but the gender disparity in education has narrowed. The overall literacy rate for the population aged 15 years and over is high at 95.8 percent, with 97.0 percent for men and 94.6 percent for women. Women in the poorest households have the lowest rate, at 84.2 percent. There is near universal completion at primary and lower secondary education levels. The Gender Parity Index show the enrolment reflects the higher rate of girls' enrolment at primary and upper secondary levels. In addition, at tertiary-level completion rates, there is little gender difference at Bachelor degree level. According to GSO data, 9.4 percent and 10.8 percent of women aged 15 years and over graduated from college or university in 2016 and 2018, respectively. The equivalent figures for men were 9.5 percent and 10.7 percent in 2016 and 2018⁴⁸.

Although the ratio of women and men with a college/university degree is almost equal, women account for only a fraction of those with postgraduate qualifications. In 2019, women held 28 percent of doctoral degrees⁴⁹, which is only marginally higher than the rate reported a decade ago in 2010 at 17 percent. Gender gaps at postgraduate level are pronounced because women face obstacles in the pursuit of further study such as marriage, childbirth and the fulfillment of family responsibilities. These gender gaps are not recognized or considered in the Law on Higher Education (2018).

In addition, access to education and the quality of education remains a significant challenge for ethnic minority children irrespective of gender. The lowest literacy rate in Viet Nam is found among ethnic minority women (83.2 percent), underlining chronic educational shortfalls for non-Kinh women. The out-of-school rate for ethnic minority children, at 15.5 percent, is nearly twice as high as the national average (8.3 percent), and nearly three times higher than that for Kinh children (6.8 percent)⁵⁰. Nevertheless, over the past decade, the reported out-of-school rate has halved for Kinh children, and reduced by over 40 percent for ethnic minority children.

Due to COVID-19 epidemic, the Viet Nam Government made a very assertive decision and closed all the educational institutions since the outbreak of COVID-19 in Viet Nam happened in late January 2020. The students of all levels nationwide stay at home, many e-learning systems began to advertise their apps daily. Schools and the universities were asked to roll out their teaching to online mode⁵¹. It was not an easy situation for teachers and students. For many students and the teachers, this was the first time ever being exposed to online learning. Prior to this only one-third of the students had any experience with online learning before COVID-19 pandemic. Since then, the three main streaming platforms used for online learning in Viet Nam were Zoom, Microsoft Teams and Google Meet. But Zoom was not much preferred by Ministry of Education and Training (MOET) due to security issues.

Wage disparity

Within the educational sector workforce, women account for 76.2 percent of the total employees, from early childhood education (99.7 percent), through to basic education (primary, lower secondary and upper secondary education 72.2 percent) and tertiary education 46.9 percent⁵². However, the ratio of women in management and leadership positions is in inverse proportion to their presence in the

⁴⁸ General Statistics Office (GSO). Viet Nam Household Living Standard Survey 2016 & 2018. Hanoi: GSO.

⁴⁹ General Statistics Office (GSO). 2019. Viet Nam Population and Housing Survey 2018

⁵⁰ General Statistics Office and Committee for Ethnic Minority Affairs. 2019. Survey on socio-economic situation of 53 ethnic minorities. Hanoi: GSO

⁵¹ Pollack et al. 2020

⁵² Ministry of Labour-Invalids and Social Affairs (MOLISA). 2010. Viet Nam Employment Trends 2010. Cited in World Bank. 2011. Vietnam Country Gender Assessment. Hanoi: World Bank. op. cit

workforce. Although, data is limited, especially for the sub-national level, the MOET departmental data indicates that women account for 14.8 percent of the Ministry's Party Committee, 13 percent of Department Directors, 34.8 percent of Vice-Directors, and 19.8 percent of Leaders and Managers at the Divisional level.

The results above, associated with the social norms about which occupations are appropriate for men and women are learned at a very young age and affect the aspirations and educational choices that boys and girls make, including what field of study they choose. Difference in education could plausibly explain earnings gaps. Hence, women in Viet Nam earn less than men despite having higher levels of educational attainment.

Despite the high labor force participation rates for men and women, at 83.5 per cent and 73.2 percent respectively, this gap has been static for the past 5 years⁵³. Women in practice are disadvantaged in recruitment and promotion to leadership positions in certain Science and Technology organizations.

According to the ILO in 2018 also shows that the average monthly salary of paid workers is 5,715,000đ (Viet Nameese Dong) for men as compared with 5,225,000đ for women. This gap is equivalent to women effectively 'working for free' for one month each year, as compared with male peers. Men earned more than women both in the state and non-state sectors and in agricultural and non-agricultural industries. The average monthly salary of female workers in 2004 was only 80 percent of that of male workers, but this rate increased gradually and reached 88.3 percent in 2016. The gap in earnings is present across all age groups, widening around child-bearing age and spiking in the 55-59 age, and again around retirement age for women (at 55).

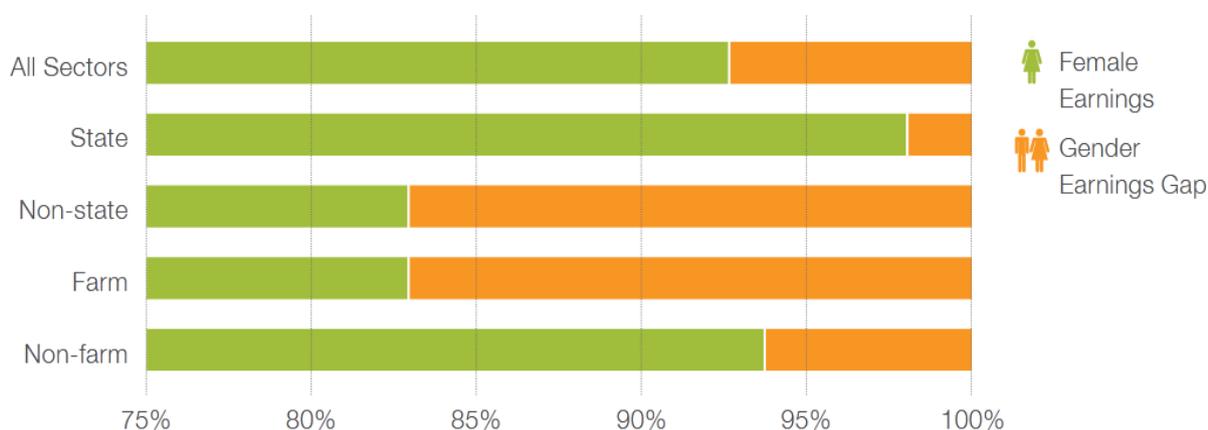


Figure 2: Female Earnings Relative to Male Earnings in Different Sectors

Source: (Chowdhury Iffat, Johnson Hillary, Mannava Aneesh, & Perova Elizaveta, 2018)

Women's knowledge and capabilities in the digital economy

Throughout history, social innovation has been the instrument for technological transformation. Viet Nam has growth from the least developing country to one of the dynamic country and a manufacturing hub in Southeast Asia. Viet Nam start with a low-skilled industry like food ware and textile then came the electronic sector which account for nearly 25% of GDP in 2015, and the massive increase of 5.2% was since 2010. Viet Nam's GDP has growth as an average of 6.4% since 2000, and this due to the adoption of technologies using IT and IoT.

With strong awareness and determination towards digital transformation have been seen from the central to local levels. The country has issued the National Digital Transformation Program till 2025, with a vision to 2030, which features three main pillars: e-government, digital economy, and digital

⁵³ ILO, 2018; UN Women, 2016

society. The plan aims to develop the formation of digital enterprises that can compete in the global market.

The results of this initiative and commitment, the tech companies have quickly adapted and responded effectively to the global lockdown during the COVID-19 pandemic to minimize the negative impact on socio-economic operation. Viet Nam has witnessed significant progress in the development of tech businesses since the Make-in-Viet Nam strategy was implemented. After a year, more than 13,000 digital tech enterprises have been established, up 28%. Viet Nam's digital tech business community currently has over 58,000 companies – a record number, as at first, the project was expected to see only 6,000 enterprises a year at its peak⁵⁴.

Despite the huge increasing in tech companies, but SMEs have a lower adoption of ICT technologies, which makes their operations harder to maintain during lockdowns. Whereas one among four of SME is owned by women. With the digitization context, women in Viet Nam cannot afford to miss out on a digital future both state and non-state sectors. If Viet Nam is to reach its goal of building a digital economy that accounts for 20 percent of GDP by 2025, it will require the right supporting enablers to help women benefit from the skill transition.

There needs to be concerted and targeted effort aimed at helping women gain access to more jobs, overcome financial constraints, and get into Science, Technology, Engineering, and Mathematics (STEM) fields is the way to eliminated the workforce transition for women in Viet Nam. At the same time, a mechanism of providing information channels suitable to women's habits and conditions; as well as support women's access to information and digital technology could be the solution to narrow the gender gap in the digital field through programs such as women's training in e-commerce and high-tech agriculture would be recommended.

Gender gap in ICT access

The government's attempts to promote and support information and communications technology (ICT) skills and internet-based learning began prior to the COVID-19 pandemic, but it has not worked well. During the COVID-19 pandemic, MoET was able to mobilize teachers across the country to devise and film TV lesson. MoET, UNICEF, Microsoft Company, Viettelland, and other private sectors are partnership to fill the gaps in the digital divide in related to devices and software in the education system especially for teachers. Teachers on the other hand were provided with guidance on how to manage online/distances learning—some online training and all teachers were expected to report to school after the national social distancing campaign. Teachers have worked very hard to engage with the new realities of their role, but their existing skill set is not aligned to remote working and the use of ICT to facilitate learning yet.

Although, Viet Nam has over 140 million phone subscribers and among the top 20 number in the world of internet user and top 10 countries having cheapest internet cost in the world. In fact, students living remote areas and children with disabilities are having trouble in access online class platforms since the announcement from the state to close school. This, because of poverty played apart as the cost of devices limited the students' possibilities for accessibility. Even though students with disadvantages were able to get devices but they still get difficulties in connecting to internet in term of signal receptions, the truth is that there is no internet infrastructure.

⁵⁴ Dharmaraj, OPENGOV, 2021)

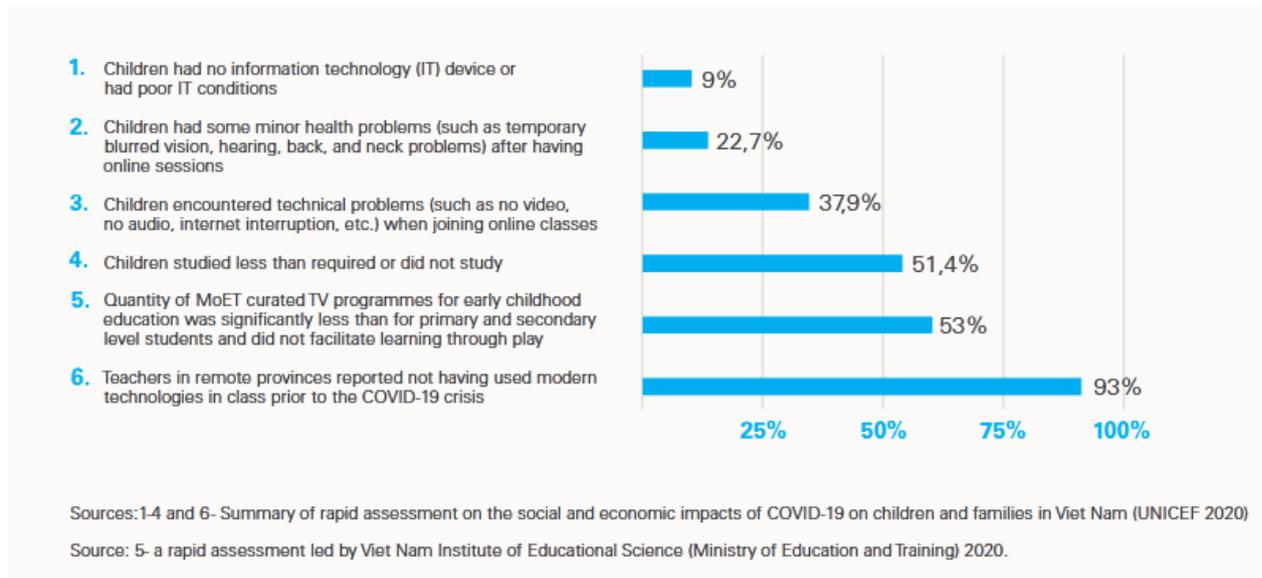


Figure 3: Distance Education during COVID-19 Pandemic-Difficulties Examine Source: (UNCEF, 2021)

The absence of mobile ownership data with sex-disaggregation, it is difficult to identify the gender gap in access to devices. However, according to Kemp in 2021, there are minor gender gap in access to all websites, especially YouTube, female and male have different shared, 41.4% and 58.6%11 respectively. These, indicated genderless in access to digital devices, but the gender gap is still existed in meaningful of participation in this sector. Recently, the government established a program called 'Internet Connection and Computers for Students' was recently inaugurated at an online ceremony, chaired by the recent Prime Minister, Pham Minh Chinh. The project calls for increased support for students who cannot afford computers as online learning becomes a part of the “new normal”. The program aims that the whole country will be connected to the Internet. As many as one million disadvantaged students will be equipped with electronic devices for online learning. In the 2022-2023 periods, no students will lack computers for online learning.

#	WEBSITE	MOBILE SHARE	COMPUTER SHARE	FEMALE SHARE	MALE SHARE	AGE 18-24 SHARE	AGE 25-34 SHARE	AGE 35-44 SHARE	AGE 45-54 SHARE	AGE 55-64 SHARE	AGE 65+ SHARE
01	GOOGLE.COM	77.4%	22.6%	42.6%	57.4%	17.4%	32.0%	17.0%	12.9%	11.6%	9.1%
02	VNEXPRESS.NET	92.4%	7.6%	45.4%	54.6%	45.3%	33.5%	71%	8.7%	4.2%	1.2%
03	24H.COM.VN	92.5%	7.5%	43.4%	56.6%	45.6%	33.4%	70%	8.9%	3.9%	1.2%
04	YOUTUBE.COM	371%	62.9%	41.4%	58.6%	19.3%	34.8%	16.7%	11.5%	9.4%	8.3%
05	KENHI4.VN	91.2%	8.8%	47.9%	52.1%	45.3%	34.2%	7.3%	7.8%	3.9%	1.5%
06	FACEBOOK.COM	53.6%	46.4%	47.5%	52.5%	15.2%	28.6%	17.8%	14.5%	12.8%	11.1%
07	XOSODAIPHAI.COM	98.6%	1.4%	36.1%	63.9%	46.9%	31.8%	7.2%	9.1%	3.6%	1.5%
08	GOOGLE.COM.VN	68.9%	31.1%	40.2%	59.8%	35.1%	33.7%	11.4%	9.7%	6.6%	3.4%
09	DANTRU.COM.VN	92.2%	7.8%	45.0%	55.0%	45.2%	33.1%	70%	9.1%	4.4%	1.3%
10	VIETNAMNET.VN	90.3%	9.7%	43.7%	56.3%	45.9%	33.1%	6.8%	8.9%	4.1%	1.1%

31 SOURCE: SEMRUSH (JAN 2021) NOTES: FIGURES REPRESENT WEBSITE TRAFFIC ONLY AND DO NOT INCLUDE USE OF NATIVE MOBILE APPS. DEVICE SHARE BASED ON TOTAL WEBSITE TRAFFIC IN DECEMBER 2020. AGE AND GENDER SHARES BASED ON UNIQUE VISITORS AGED 18+ IN DECEMBER 2020. GENDER DATA IS ONLY AVAILABLE FOR FEMALE AND MALE VISITORS, SO FIGURES SHOWN HERE REPRESENT SHARE OF THOSE GENDERS. ADVISORY: SOME WEBSITES IN THIS LIST MAY CONTAIN ADULT CONTENT. PLEASE USE CAUTION WHEN VISITING UNKNOWN SITES.

we are social Hootsuite

Figure 4: Traffic share by Device, Age and Gender (Source: Kemp 2021)

Literacy of female instructors and students in ICT

ICT is a unique mechanical system for any organization and country to achieve commercial and instructional development before ensuring competitive advantages because it is progressively imperative in our educational framework⁵⁵. In the fourth industrial revolution, teachers need to equip themselves with essential skills and practical knowledge about ICT implementation to enhance further their teaching techniques as well as the students' absorption process⁵⁶.

According to Nguyen and Nguyen (2008), the Viet Nameese Government has conducted many educational reforms, from primary school to higher education such as staff qualifications, new curriculums and textbook production, educational makers, and human resources in the 21st century. However, they did not take teachers' pre-service technology training as well as pre-service teachers' ICT ability and efficacy into account; therefore, the educational dilemmas remain unchanged⁵⁷.

One out of eight of teachers (13%) in Viet Nam are aged 50 and above (OECD average 34% in 2018) and aging teacher usually far behind the use of ICT in their teaching career as they get use to the old style of teaching. The same source also pointing out that 55.5% teachers reporting a high level of need for professional development in ICT skills. From the sex-disaggregated data by field shows that 80% of female students choose to be become teacher, but ICT competence or skills and ICT confidence is a great barrier for these female teachers in the practice of remote learning, and teacher with no computer skills would neglect to carry out their online class.

The COVID-19 pandemic has accelerated the digital transformation process in various fields and created opportunities but also posed a number of difficulties for women and girls, due a lack of skills in information technology application and lesser experience working in an international environment. Without proper support, women and girls more likely to be vulnerable in this sector.

⁵⁵ Taylor, 2015

⁵⁶ Gerald Knezek & Rhonda Christensen, 2008

⁵⁷ Tran Nga, Le Thanh, Nguyen Lan, Hoang Linh & Nguyen Thuy , 2020